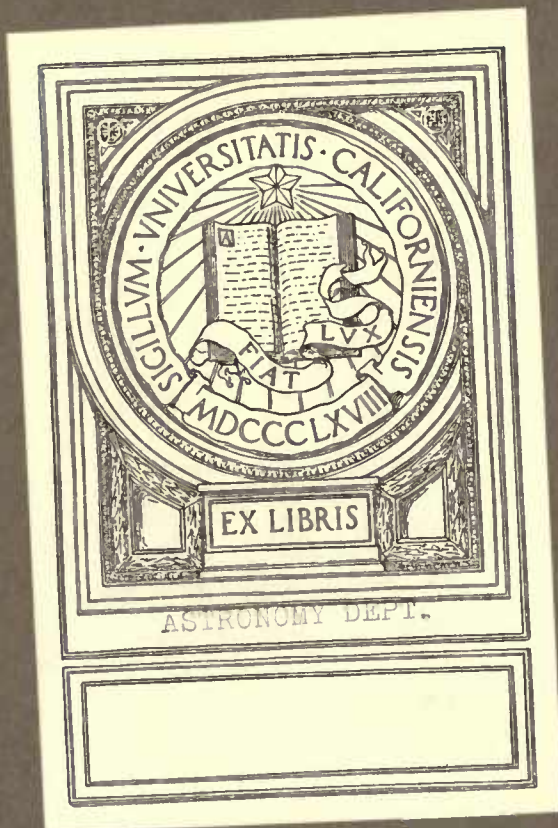


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# HELIOGRAPHIC POSITIONS OF SUN-SPOTS

OBSERVED AT HAMILTON COLLEGE  
FROM 1860 TO 1870

BY

DR. C. H. F. PETERS

Professor of Astronomy and Director of Litchfield Observatory

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WASHINGTON, D. C.:  
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## INTRODUCTION

The observations now finally published in this volume were made by Professor Peters, during the decade beginning in 1860, with the 13-inch Spencer refractor of the Litchfield Observatory of Hamilton College, at Clinton,<sup>1</sup> N. Y. They were prepared in tabular form by their author for publication, and his 412 pages of manuscript tables, with some minor omissions, served the printer as copy. It is supposed that Dr. Peters also wrote an introduction describing the methods of observation and reduction, but unfortunately this seems to have been hopelessly lost. The fourteen original notebooks entitled, "Observationes astronomicae originales Maculae Solis," are preserved in good condition. These contain for each date a pencil sketch of the appearance of the spots on the sun's disk (of diameter about 11 cm), presumably copied from the larger sketch made on the projection screen. They also record the readings from the chronograph sheets and the declination scale, together with the clock error.

There were also preserved the 312 sheets of reductions, representing the logarithmic work involved in deriving the heliographic latitude and longitude. These also show what reduction quantities, calculated from the adopted elements of the sun's rotation, were used each day, but they do not state whence the elements were derived. The author doubtless computed tables for his own use in the work, but they have not been found. Investigation has shown that he employed for the longitude of the node and the inclination the values derived by Carrington from his long series of observations, and recommended by him for future adoption, viz.,  $N = 73^{\circ} 40'$  for 1850,  $I = 7^{\circ} 15'$ . Dr. Peters employed a different period and a different epoch from those of Carrington, and reckoned his longitudes in the opposite direction.

In order to give, in the author's own words, a general description of the procedure followed in the observations, the editor has translated the following article by Dr. Peters, which appeared in Band 64, pp. 209-213 (1865), of *Astronomische Nachrichten*.

"In the observations which have been made here since May 1860 on the phenomena of the solar surface, the principle was adopted of measuring as far as possible everything of a measurable character that appeared on the solar disk. Therefore in the first instance the co-ordinates were determined of all the visible spots on each date, and these determinations were extended to all the isolated dots and the principal members of groups; also, indeed, to many faculae of definite form. For spots of considerable extent the dimensions of the umbra and penumbra were micro-metrically determined, generally in the direction of declination and right ascension. An accurate sketch was always prepared before the observations and was a necessary auxiliary, partly for convenience as a reference map during the observations and partly for the comparative study both of the changes in the forms of the spots and the arrangements of the components of the groups, as well as of the intensity of the outbursts and their relative positions and sequence. In the winter months observations were made on every favorable day; but in summer, when fair weather can be more safely counted on, every second day was made the rule, inasmuch as this was in general sufficient for keeping the spots under watch in their different stages; and, moreover, the use of the refractor for the observations at night always required a somewhat disturbing exchange of the attachments at the eyepiece.

"For the observation of the sun the image was projected on a screen which, firmly attached to the refractor, shared in its motions. At the lower end of the large tube of the telescope two wooden rings were put on at some distance apart; each having four corresponding holes through which wooden rods, only slightly elastic, projected about one and a half feet. The projection board was fastened in notches cut in these rods at the same distance from the eyepiece, and was held in place by the springing of the rods. This not only assured the perpendicularity of the plane of projection with respect to the optical axis but it also prescribed that the distance of the plane of projection from the eyepiece was always the same when the latter was drawn out to a definite mark corresponding to the sharpest image. To the board was attached a rather stiff sheet of paper on which had been drawn two systems of parallel lines crossing each other at right angles. A single pin, passing through the center of these lines, attaches the paper at the point where the center of the image of the field of the telescope falls. By turning the sheet around the pin, the lines can thus be made parallel to the directions of declination and hour angle. It is only necessary for this purpose to let the sun's limb, or any distinct spot, run across parallel to one of the system of lines, preferably along

<sup>1</sup> Latitude =  $43^{\circ} 3' 17''$

Longitude =  $5^{\text{h}} 1^{\text{m}} 37^{\text{s}} 5$  W.

960570



the central line. Since the angular distances from the center are projected toward the tangent, all points which transit describe hyperbolic curves. Thus we have a network of declination and time threads. For measuring differences of declination the central vertical line is graduated like a scale, and since the field of view permits the whole solar image to be seen, the scale-reading can be expressed in seconds of arc with the aid of the known apparent diameter of the sun. As one division has a linear value of  $\frac{1}{8}$  inch (with an angular value of about  $23''$ ), the tenths, and sometimes the twentieths, can readily be estimated. The differences of right ascension are measured by the diurnal motion with the aid of a chronograph. In order to avoid a correction which would arise from the projection above mentioned upon the plane, the transits were so arranged that use was made either of the line passing through the center of the field or of symmetrically situated pairs of lateral threads.

"The eyepiece used is a so-called negative one of the Huyghens form, having two plano-convex lenses with focal lengths of 3.90 and 1.75 inches. The magnification is approximately 75, and the field of view is  $38'$ , so that it embraces on each side  $3'$  more than the whole solar disk. The eyepiece is drawn out 1.45 inches in order to make the image distinctly visible at the distance of the projection board from the eye lens—15.43 inches. The actual magnification of the image is here about 140 times, or the number which we obtain if the magnification given above is multiplied by the quotient of the distance of the table divided by the distance of distinct vision (7 to 8 inches).

"Further explanation is required of the conversion of the scale-distance into arc whereby the distance in declination of a spot from the sun's center is measured. On account of the size of the angles under which the rays fall upon the paper, the tangents can no longer be held to be proportional to the arc, and the value of a scale-division decreases from the center of the field toward the edge. These angles have their vertex at the position for the eye; or rather, in this case, where the eyepiece is drawn out, in more general terms in the point through which all rays pass after emergence from the eyepiece, and therefore the distance of this point from the board is concerned. Instead of computing this from the dimensions of the system of lenses, we in practice get a knowledge of this most simply by pointing the telescope toward the brightly illuminated sky and rendering the emergent pencil visible (as by blowing smoke upon it). Let us denote this distance, expressed in scale-divisions, by  $D$ , the angle of the cone of the sun's disk formed at the intersection by  $G$ ;  $g$  is similarly the angle at the same point between the spot and the sun's center,  $\rho$  is the apparent radius of the sun,  $S$  its magnitude read off from the table,  $s$  the distance of the spot from the sun's center. Then we have

$$\tan G = \frac{S}{D}, \quad \tan g = \frac{s}{D}, \quad \text{whence} \quad \frac{s \tan G}{S \tan g} = 1;$$

therefore

$$\rho \frac{g}{G} = \rho \cdot \frac{s}{S} \cdot \frac{g}{G} \cdot \frac{\tan G}{\tan g}.$$

But the last is the difference in declination of the spot and the sun; therefore

$$\Delta\delta = \rho \frac{s}{S} \cdot \frac{\tan G}{G} \cdot \frac{g}{\tan g},$$

which is most conveniently adapted to calculation in the form

$$\log \Delta\delta = \log s + \log \frac{\rho}{S} + \frac{2}{3} \log \sec G - \frac{2}{3} \log \sec g.$$

A small table of double entry, with the arguments  $s$  and  $\rho$ , gives  $\Delta\delta$  directly. For the apparatus here  $D = 1190$ , and on the average  $G = 19^\circ 30'$ . The diameter of the solar image measures somewhat over ten inches on the paper.

"The transits for right ascension are as a rule taken four times, twice before and twice after reading off the declinations, each time over one thread. When the number of spots is large, as has often been the case in recent years; and several groups fall at the same hour-angle, each section has to be determined for itself. The usefulness of the chronograph should be particularly recognized in such cases as this where the objects follow each other in rapid succession—often separated by only a fraction of a second. The clock is regulated to mean time so that the differences of right ascension are obtained without further reduction, since the departure of the rate from apparent solar time does not come into consideration, never exceeding  $\frac{1}{30000}$ . The accuracy obtained, as well as the simplicity of the reduction and the whole procedure will be the more readily perceived from the following example. The separate groups of each day are distinguished in order of right ascension by the capital letters, the separate spots of the groups in the same order by the small letters with the attached exponents; but the most conspicuous spot of each group is assigned the letter without an exponent; different nuclei in the same penumbra receive subscripts. This mode of designation is preferable to that of current numbers.



EXAMPLE  
1863. March 13.

	CHRONOGRAPH READINGS		DECLINATION SCALE	CHRONOGRAPH READINGS		R. A. FROM SUN'S CENTER					DECLINATION	
	Set I	Set II		Set III	Set IV	I	II	III	IV	Mean	Divisions	"
☉ Limb	0 <sup>h</sup> 39 <sup>m</sup> 11 <sup>s</sup> .4	41 <sup>m</sup> 33 <sup>s</sup> .5	+46.2	0 <sup>h</sup> 48 <sup>m</sup> 28 <sup>s</sup> .4	0 <sup>h</sup> 50 <sup>m</sup> 57 <sup>s</sup> .1	....	....	....	....	....	+43.9	....
<i>A a</i>	24.3	45.8	-20.7	40.9	51 9.6	-51 <sup>s</sup> .7	-52 <sup>s</sup> .3	-52 <sup>s</sup> .2	-52 <sup>s</sup> .1	-52 <sup>s</sup> .05	-23.0	-521
<i>a</i> <sup>1</sup>	24.9	46.6	-20.8	41.8	10.4	51.1	51.5	51.4	51.3	51.3	-23.1	-523
<i>B b</i>	58.3	42 20.2	-6.0	49 15.2	44.0	17.7	17.9	17.9	17.7	17.8	-8.3	-190
<i>C c</i>	40 5.2	27.6	-4.0	22.2	50.9	10.8	10.5	11.0	10.8	10.8	-6.3	-144
<i>d</i>	7.6	29.5	+0.4	24.6	53.3	8.4	8.6	8.5	8.4	8.45	-2.0	-45
<i>d</i> <sup>1</sup>	9.8	31.9	+0.7	26.8	55.5	6.2	6.2	6.3	6.2	6.2	-1.6	-37
<i>D d</i> <sup>2</sup>	10.2	32.3	+1.9	27.3	56.0	5.8	5.8	5.8	5.7	5.75	-0.4	-9
<i>d</i> <sup>3</sup>	11.9	34.0	+1.4	28.8	57.5	4.1	4.1	4.3	4.2	4.15	-0.9	-21
<i>d</i> <sup>4</sup>	14.0	36.2	+0.6	31.1	59.6	2.0	1.9	2.0	2.2	2.0	-1.7	-39
<i>e</i> <sup>1</sup>	28.3	50.3	+3.6	45.2	52 13.8	+12.3	+12.3	+12.1	+12.1	+12.2	+1.3	+30
<i>E e</i> <sup>2</sup>	29.0	51.2	+3.0	46.0	15.0	13.0	13.1	12.9	13.3	13.1	+0.7	+16
<i>e</i>	32.7	54.6	+1.0	49.8	18.5	16.7	16.6	16.7	16.8	16.7	-1.3	-30
Penumbra	41 3.5	43 25.0	+30.3	....	49.2	47.7	47.0	....	47.5	47.3	+28.0	+631
<i>F</i> Center	4.2	25.7	+29.8	50 20.9	49.9	48.2	47.7	47.7	48.2	47.95	+27.5	+620
Penumbra	5.0	26.8	+29.3	....	50.7	49.0	48.7	....	49.0	48.85	+27.0	+609
☉ Limb	20.6	42.7	-41.6	37.9	53 6.3	....	....	....	....	....	-43.9	....
☉ Center	0 <sup>h</sup> 40 <sup>m</sup> 15 <sup>s</sup> .97	0 <sup>h</sup> 42 <sup>m</sup> 38 <sup>s</sup> .05	+2.3	0 <sup>h</sup> 49 <sup>m</sup> 33 <sup>s</sup> .13	0 <sup>h</sup> 52 <sup>m</sup> 1 <sup>s</sup> .7	64 <sup>s</sup> .58	64 <sup>s</sup> .60	64 <sup>s</sup> .78	64.60	64 <sup>s</sup> .64		

"The mean of the times is 0<sup>h</sup> 46<sup>m</sup> 7<sup>s</sup>.2, and the correction of the clock +8<sup>s</sup>.5, so that the observations as taken are valid for 0<sup>h</sup> 46<sup>m</sup> 15<sup>s</sup>.7 mean time.

"The probable error of an observation was deduced to be  $\pm 0^{\circ}.11$  from a number of determinations of the time of transit of the sun's radius, by means of the deviations from the average of each day. For a spot the error in general will be somewhat greater; and since on the one hand this has to be multiplied by a number larger than  $\sqrt{2}$ , while on account of being the average of four determinations, it must on the other hand be divided by 2, we may estimate the accuracy of the determination as 1'.5. The probable error in declination will be about the same, since here the limit of reading is from  $\frac{1}{20}$  to  $\frac{1}{10}$  of a scale-division."

The formulae now involved are simply derived by applying the three fundamental formulae of spherical trigonometry to the triangle having as its vertices the spot, the sun's pole and the center of the disk.

Let  $\Delta\alpha$  and  $\Delta\delta$  represent the differences in right ascension and declination of the spot and the center of the disk. Let  $p$  be the "zenith distance of the earth as seen from the spot," and  $n$  be the geocentric distance of the spot from the center of the disk. Then  $n = \rho \sin p$ , where  $\rho$  is the sun's radius.  $P$  is the symbol for the position angle of the spot, reckoned from the east through the north, and  $N$  is the position angle of the sun's pole.  $B$  is the heliographic latitude of the spot,  $B_0$  that of the center of the disk;  $L$  and  $L_0$  are the heliographic longitudes of the spot and of the center of the disk from the node.

Then we have

$$\frac{\Delta\alpha''}{\rho} = \sin p \cos P;$$

$$\frac{\Delta\delta''}{\rho} = \sin p \sin P.$$

$$\begin{aligned}\sin B &= \cos(p-n) \sin B_0 + \cos B_0 \sin(p-n) \sin(P-N); \\ \cos B \cos(L-L_0) &= \cos(p-n) \cos B_0 - \sin B_0 \sin(p-n) \sin(P-N); \\ \cos B \sin(L-L_0) &= \sin(p-n) \cos(P-N).\end{aligned}$$

For adaptation to logarithmic computation, let

$$\begin{aligned}g \sin \xi &= \sin(p-n) \sin(P-N), \\ g \cos \xi &= \cos(p-n).\end{aligned}$$

Then we get

$$\begin{aligned}\sin B &= g \sin(B_0 + \xi); \\ \cos(L-L_0) \cos B &= g \cos(B_0 + \xi); \\ \sin(L-L_0) \cos B &= \sin(p-n) \cos(P-N).^1\end{aligned}$$

<sup>1</sup> It seems that it would have been more expeditious to use addition and subtraction logarithms and employ the first and third of the fundamental formulae, solving  $(L-L_0)$  by the tangent only when necessary.



An example of the author's reduction sheet now follows:

March 13, 1863. oh 46<sup>m</sup> Clinton Mean Time

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	$lg \Delta a$	$lg \Delta \delta$	$\sin p \sin P$	$\sin p \cos P$	$\sin$ or $\cos P$	$P$	$\sin p$	$\frac{\sin(p-n)}{\sin p}$	$P-N$	$\cos(P-N)$
<i>a</i> .....	1.7164 <i>n</i>	2.7168 <i>n</i>	9.7304 <i>n</i>	9.9055 <i>n</i>	9.9198	213° 45'	9.9856	- 5	189° 21'	9.9942 <i>n</i>
<i>a</i> <sup>1</sup> .....	1.7101 <i>n</i>	2.7185 <i>n</i>	9.7321 <i>n</i>	9.8992 <i>n</i>	9.9173	214 14	9.9818	5	189 50	9.9936 <i>n</i>
<i>b</i> .....	1.2504 <i>n</i>	2.2788 <i>n</i>	9.2924 <i>n</i>	9.4395 <i>n</i>	9.9108	215 29	9.5287	19	191 5	9.9918 <i>n</i>
<i>c</i> .....	1.0334 <i>n</i>	2.1584 <i>n</i>	9.1720 <i>n</i>	9.2225 <i>n</i>	9.8733	221 40	9.3492	20	197 16	9.9799 <i>n</i>
<i>d</i> .....	0.9269 <i>n</i>	1.6532 <i>n</i>	8.6668 <i>n</i>	9.1160 <i>n</i>	9.9742	199 34	9.1418	20	175 10	9.9984 <i>n</i>
<i>d</i> <sup>1</sup> .....	0.7924 <i>n</i>	1.5682 <i>n</i>	8.5818 <i>n</i>	8.9815 <i>n</i>	9.9680	201 43	9.0135	20	177 19	9.9995 <i>n</i>
<i>d</i> <sup>2</sup> .....	0.7597 <i>n</i>	0.9542 <i>n</i>	7.9678 <i>n</i>	8.7488 <i>n</i>	9.9976	185 58	8.9511	20	161 34	9.9771 <i>n</i>
<i>d</i> <sup>3</sup> .....	0.6180 <i>n</i>	1.3222 <i>n</i>	8.3358 <i>n</i>	8.8071 <i>n</i>	9.9765	198 40	8.8306	20	174 16	9.9978 <i>n</i>
<i>d</i> <sup>4</sup> .....	0.3010 <i>n</i>	1.5911 <i>n</i>	8.6074 <i>n</i>	8.4901 <i>n</i>	9.8993	232 28	8.7054	20	208 4	9.9457 <i>n</i>
<i>e</i> <sup>1</sup> .....	1.0864	1.4771	8.4907	9.2755	9.9942	9 19	9.2813	20	344 55	9.9848
<i>e</i> <sup>2</sup> .....	1.1173	1.2041	8.2177	9.3064	9.9986	4 40	9.3078	20	340 16	9.9737
<i>e</i> .....	1.2227	1.4771 <i>n</i>	8.4007 <i>n</i>	9.4118	9.9969	353 10	9.4149	20	328 46	9.9320
<i>f</i> .....	1.6808	2.7924	9.8060	9.8699	9.8791	40 48	9.9908	4	16 24	9.9820

$$8.1891$$

$$lg \frac{15 \cos \delta}{\rho}$$

$$7.0136$$

$$lg \frac{1}{\rho}$$

$$-24^{\circ} 24'$$

$$N$$

$$2.9864$$

$$lg \rho$$

(1)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
	$\sin(p-n)$	$\sin(P-N)$	$\frac{(12)+(13)}{\equiv g \sin \zeta}$	$\frac{\cos(p-n)}{\equiv g \cos \zeta}$	$\cos \zeta$	$\zeta$	$B_0 + \zeta$	$\sin(B_0 + \zeta)$	$lg g$	$\cos(B_0 + \zeta)$
<i>a</i> .....	9.9851	9.2108 <i>n</i>	9.1959 <i>n</i>	9.4102	9.9312	-31° 24'	-38° 34'	9.7949 <i>n</i>	9.4790	9.8931
<i>a</i> <sup>1</sup> .....	9.9813	9.2324 <i>n</i>	9.2137 <i>n</i>	9.4583	9.9390	-29 39	-36 49	9.7776 <i>n</i>	9.5193	9.9034
<i>b</i> .....	9.5268	9.2838 <i>n</i>	8.8106 <i>n</i>	9.9739	9.9990	- 3 56	-11 6	9.2845 <i>n</i>	9.9749	9.9918
<i>c</i> .....	9.3472	9.4727 <i>n</i>	8.8199 <i>n</i>	9.9890	9.9990	- 3 52	-11 2	9.2822 <i>n</i>	9.9900	9.9919
<i>d</i> .....	9.1398	8.9256	8.0654	9.9958	0.0000	+ 0 40	- 6 30	9.0539 <i>n</i>	9.9958	9.9972
<i>d</i> <sup>1</sup> .....	9.0115	8.6704	7.6819	9.9977	0.0000	+ 0 16	- 6 53	9.0791 <i>n</i>	9.9977	9.9968
<i>d</i> <sup>2</sup> .....	8.9491	9.5000	8.4491	9.9983	9.9998	+ 1 37	- 5 33	8.9855 <i>n</i>	9.9985	9.9980
<i>d</i> <sup>3</sup> .....	8.8285	8.9906	7.8281	9.9990	0.0000	+ 0 23	- 6 47	9.0723 <i>n</i>	9.9990	9.9969
<i>d</i> <sup>4</sup> .....	8.7033	9.6726 <i>n</i>	8.3759	9.9994	9.9999	- 1 22	- 8 32	9.1714 <i>n</i>	9.9995	9.9952
<i>e</i> <sup>1</sup> .....	9.2793	9.4153 <i>n</i>	8.6946 <i>n</i>	9.9920	9.9994	- 2 53	-10 3	9.2418 <i>n</i>	9.9925	9.9933
<i>e</i> <sup>2</sup> .....	9.3058	9.5285 <i>n</i>	8.8343 <i>n</i>	9.9909	9.9989	- 3 59	-11 9	9.2864 <i>n</i>	9.9919	9.9917
<i>e</i> .....	9.4129	9.7148 <i>n</i>	9.1277 <i>n</i>	9.9849	9.9958	- 7 54	-15 4	9.4151 <i>n</i>	9.9891	9.9848
<i>f</i> .....	9.9904	9.4508	9.4412	9.3179	9.9025	+53 1	+45 51	9.8559	9.5387	9.8429

$$-7^{\circ} 10'$$

$$B_0$$

(1)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)
	$\frac{\sin(p-n) \times \cos(P-N)}{\cos \zeta}$	$g \cos(B_0 + \zeta)$	$\frac{\sin(L-L_0) \text{ or } \cos(L-L_0)}{\cos \zeta}$	$L-L_0$	$g \sin(B_0 + \zeta) \equiv \sin B$	$\cos B$	$B$	$L$	$L'$	Mar. 12	Mar. 14
<i>a</i> .....	9.9793 <i>n</i>	9.3721	9.9871	-76° 7'	9.2739 <i>n</i>	9.9922	-10° 50'	185° 1'	6° 5'	<i>a</i>	-
<i>a</i> <sup>1</sup> .....	9.9749 <i>n</i>	9.4227	9.9836	74 20	9.2969 <i>n</i>	9.9913	-11 26	186 48	7 52	<i>a</i> <sup>3</sup>	-
<i>b</i> .....	9.5186 <i>n</i>	9.9667	9.9740	19 37	9.2594 <i>n</i>	9.9927	-10 28	241 31	62 35	<i>c</i>	<i>o</i>
<i>c</i> .....	9.3271 <i>n</i>	9.9819	9.9896	12 29	9.2722 <i>n</i>	9.9923	-10 47	248 39	69 43	<i>d</i>	<i>b</i>
<i>d</i> .....	9.1382 <i>n</i>	9.9930	9.9958	7 57	9.0497 <i>n</i>	9.9972	- 6 26	253 11	74 15	<i>e</i>	<i>c</i> <sub>1</sub> <i>c</i> <sub>2</sub>
<i>d</i> <sup>1</sup> .....	9.0110 <i>n</i>	9.9945	9.9977	5 56	9.0768 <i>n</i>	9.9968	- 6 51	255 12	76 16	<i>o</i>	<i>o</i>
<i>d</i> <sup>2</sup> .....	8.9262 <i>n</i>	9.9905	9.9984	4 52	8.9840 <i>n</i>	9.9981	- 5 32	256 16	77 20	<i>e</i> <sup>2</sup>	<i>c</i> <sup>2</sup>
<i>d</i> <sup>3</sup> .....	8.8263 <i>n</i>	9.9959	9.9990	3 52	9.0713 <i>n</i>	9.9969	- 6 46	257 16	78 20	<i>e</i> <sup>3</sup>	<i>c</i> <sup>3</sup>
<i>d</i> <sup>4</sup> .....	8.6490 <i>n</i>	9.9947	9.9996	2 35	9.1709 <i>n</i>	9.9951	- 8 32	258 33	79 37	<i>o</i>	..
<i>e</i> <sup>1</sup> .....	9.2641	9.9858	9.9923	+10 45	9.2343 <i>n</i>	9.9935	- 9 53	271 53	92 57	<i>f</i> <sup>1</sup>	<i>d</i> <sup>1</sup> ?
<i>e</i> <sup>2</sup> .....	9.2795	9.9836	9.9917	11 11	9.2783 <i>n</i>	9.9919	-10 57	272 19	93 23	<i>f</i> <sup>2</sup>	<i>d</i> <sup>2</sup>
<i>e</i> .....	9.3449	9.9739	9.9883	13 13	9.4042 <i>n</i>	9.9856	-14 41	274 21	95 25	<i>f</i>	<i>d</i>
<i>f</i> .....	9.9724	9.3816	9.9861	75 37	9.3946	9.9862	+14 22	336 45	157 49	-	<i>e</i>

$$261^{\circ} 8'$$

$$L_0$$

$$181^{\circ} 4'$$

$$-178 56$$

$$\text{long. of}$$

$$\text{prime meridian}$$

$$\text{from node}$$

The scheme of computation explains itself. In the ninth column the author sometimes gives  $n$  and sometimes  $\frac{\sin(p-n)}{\sin p}$ , for either of which a table with argument  $\sin p$  could easily have been constructed. The elements of the sun's rotation, as employed by the author, are:



Longitude of the ascending node of sun's equator =  $73^{\circ} 40'$  for 1850.

Inclination of axis to axis of ecliptic =  $7^{\circ} 15'$ .

(These were the values recommended by Carrington.)

Mean daily rotation angle =  $842'.04 = 14^{\circ} 034$ ,

or Mean sidereal rotation period = 25.652 days.

This value was derived by Dr. Peters from his observations of 803 positions of 286 spots made at Naples in the thirteen months from September 1845 to October 1846, as stated in his paper read at the Providence meeting of the American Association, 1855.

"First solar meridian that in which the earth was at Greenwich mean noon 1860 January 0."

"I reckon the longitudes in the sense that any point of the heavens would, as a result of the sun's rotation, successively pass increasing meridians. This would correspond on the earth to counting longitudes westward as positive" (*A. N.*, 71, 241, 1868).

"To avoid ambiguity, it may be prefaced that the heliographical longitudes are counted in the direction opposite to that of the rotation of the sun (or what corresponds upon the earth from the east toward the west), and a spot is said to be *following* another neighboring one, when the former has greater heliographical longitude,—when by the rotation of the sun, it will come later into the same heliocentric position in regard to the fixed stars than the *preceding* spot." (*Astronomical Notices*, No. 29, March 18, 1862.)

In order to facilitate the comparison of longitudes given by Peters with those of Carrington and those at Kew and at Greenwich, a conversion-table is given for each date of observation by Peters. A rigorous comparison cannot be made with Carrington's positions, as the latter were derived from assumed values of the longitude of the node and inclination, to which small corrections were obtained by Carrington from his whole series of observations. The difference is not, however, of any consequence in the identification of spots.

The following table, which has been calculated by Mr. Philip Fox, gives the angular distances between the prime meridians of the systems of Carrington and Peters for Clinton noon of each day when Peters observed. The conversion is effected by merely subtracting Peters' *L'* from the tabular value for the date (increased by  $360^{\circ}$  where necessary), after due allowance has been made for the difference in time of observation and in longitude of the place of observation.

TABLE OF ANGULAR DISTANCES BETWEEN THE PRIME MERIDIANS OF PETERS AND CARRINGTON  
For Clinton noon of each day on which Peters observed.

1860			1861								
May	23	213°.39	July	11	206°.02	Sept.	25	194°.59	Dec.	15	182°.40
	24	.24		15	205.41		26	.44		23	181.20
	25	.08		18	204.96		28	.13			
	29	212.48		20	.66		30	193.83			
June	3	211.73		22	.36	Oct.	6	192.93	Jan.	2	179°.70
	4	.58		24	.06		7	.78		4	.39
	5	.43		28	203.46		10	.33		5	.25
	6	.28		30	.16		12	.03		12	178.19
	11	210.53	Aug.	31	.01		15	191.58		22	176.69
	12	.38		1	202.86		16	.43		23	.54
	13	.23		3	.56		18	.13		25	.24
	14	.08		5	.26		19	190.98		27	175.94
	15	209.93		6	.11		24	.22	Feb.	1	.18
	16	.78		11	201.35		25	.07		6	174.43
	17	.63		15	200.75		27	189.77		12	173.53
	18	.48		16	.60		30	.32		14	.23
	19	.33		17	.45		31	.17		16	172.93
	20	.17		18	.30	Nov.	4	188.57		22	.02
	27	208.12		19	.15		5	.42		25	171.57
	28	207.97		20	.00		7	.12		26	.42
	30	.67	Sept.	15	196.09		8	187.97		27	.27
July	4	.07		17	195.79		16	186.76		28	.12
	6	206.77		18	.64		22	185.86	Mar.	4	170.52
	7	.62		20	.34		24	.56		7	.07
	8	.47		22	.04		25	.41		11	169.47
	9	.32		23	194.89		28	184.96		15	168.87
				24	.74	Dec.	14	182.55		16	.72



1861												
Mar.	18	168°.42	July	27	148°.71	Jan.	4	124°.50	July	7	96°.82	
	19	.27	Aug.	1	147°.96		7	.05		8	.67	
	20	.11		3	.66		11	123°.45		10	.37	
	22	167°.81		4	.51		13	.14		11	.22	
	23	.66		11	146°.46		14	122°.99		13	95°.92	
	25	.36		14	.01		16	.69		15	.62	
	28	166°.91		16	145°.70		24	121°.49		18	.17	
	31	.46		18	.40		27	.04		19	.02	
Apr.	4	165°.86	Sept.	19	.25		31	120°.44		25	94°.12	
	5	.71		7	142°.40	Feb.	5	119°.68		27	93°.81	
	6	.56		9	.09		7	.38		29	.51	
	7	.41		12	141°.64		8	.23		31	.21	
	8	.26		15	.19		11	118°.78	Aug.	2	92°.91	
	9	.11		22	140°.14		16	.03		4	.61	
	10	164°.96		24	139°.84	Mar.	8	115°.02		6	.31	
	11	.81		26	.54		9	114°.87		8	.01	
	19	163°.60		29	.09		11	.57		10	91°.71	
	21	.30	Oct.	1	138°.79		13	.27		12	.41	
	22	.15		8	137°.73		18	113°.52		14	.11	
	23	.00		10	.43		19	.37		15	90°.96	
	25	162°.70		12	.13		20	.22		17	.66	
	26	.55		14	136°.83		25	112°.47		18	.51	
	27	.40		20	135°.93		26	.31		20	.21	
	29	.10		21	.78		27	.16		22	89°.91	
May	2	161°.65		25	.18		28	.01		24	.60	
	4	.35		26	.03		29	111°.86		26	.30	
	5	.20		27	134°.87	Apr.	4	110°.96		29	88°.85	
	7	160°.89		28	.72		6	.66		31	.55	
	9	.59		29	.57		7	.51	Sept.	3	.10	
	12	.14	Nov.	1	.12		9	.21		5	87°.80	
	14	159°.84		10	132°.77		10	.06		7	.50	
	15	.69		12	.47		11	109°.91		9	.20	
	19	.09		14	.17		12	.76		11	86°.90	
	21	158°.79		15	.02		13	.61		13	.60	
	23	.49		18	131°.57		20	108°.55		15	.30	
	25	.19		19	.42		22	.25		17	85°.99	
	30	157°.44		20	.27		24	107°.95		19	.69	
	31	.28		22	130°.96		25	.80		21	.39	
June	1	.13		24	.66		26	.65		23	.09	
	5	156°.53		25	.51		27	.50		25	84°.79	
	7	.23		26	.36	May	4	106°.45		27	.49	
	9	155°.93		27	.21		5	.30	Oct.	3	83°.59	
	10	.78	Dec.	2	129°.46		6	.15		5	.29	
	12	.48		3	.31		8	105°.85		7	82°.99	
	13	.33		4	.16		10	.55		12	.23	
	17	154°.73		5	.01		11	.40		15	81°.78	
	18	.58		7	128°.71		12	.25		18	.33	
	20	.28		10	.26		14	104°.95		20	.03	
	22	153°.98		11	.11		15	.79		23	80°.58	
	24	.68		12	127°.96		17	.49		28	79°.83	
	25	.53		13	.81		20	.04		31	.38	
	27	.22		14	.66		22	103°.74	Nov.	2	.08	
	29	152°.92		15	.51		24	.44		4	78°.77	
July	1	.62		16	.36		26	.14		11	77°.72	
	3	.32		17	.20		28	102°.84		14	.27	
	5	.02		22	126°.45		30	.54		15	.12	
	7	151°.72		25	.00	June	5	101°.64		25	75°.62	
	9	.42		28	125°.55		8	.18		30	74°.86	
	11	.12		30	.25		20	99°.38		Dec.	5	.11
	17	150°.22		31	.10		22	.08		8	73°.66	
	19	149°.92					26	98°.48		11	.21	
	21	.62					29	.03		12	.06	
	23	.31					July	1	97°.73		17	72°.31
	25	.01					3	.43		20	71°.86	
							6	96°.97				
1862												
			Jan.	2	124°.80							
				3	.65							



1863			May 30	47.64	Feb. 13	313.64	July 14	290.93
Jan. 18	67.49		June 4	46.89	15	.34	17	.48
19	.34		9	.14	17	.04	18	.33
25	66.44		11	45.84	18	312.89	21	289.88
30	65.69		13	.54	21	.44	23	.57
31	.54		15	.23	24	311.98	27	288.97
Feb. 2	.24		18	44.78	25	.83	29	.67
4	64.94		20	.48	27	.53	30	.52
8	.34		22	.18	Mar. 5	310.63	Aug. 4	287.77
11	63.88		24	43.88	6	.48	8	.17
14	.43		26	.58	10	309.88	9	.02
15	.28		28	.28	11	.73	12	286.57
16	.13		30	42.98	12	.58	14	.27
17	62.98	July 2	2	.68	14	.28	16	285.96
18	.83	5	5	.23	16	308.98	18	.66
21	.38	9	9	41.63	17	.83	19	.51
23	.08	14	14	40.87	19	.53	20	.36
25	61.78	18	18	.27	21	.22	24	284.76
28	.33	20	20	39.97	23	307.92	26	.46
Mar. 2	.03	22	22	.67	27	.32	27	.31
4	60.73	24	24	.37	28	.17	Sept. 6	282.81
5	.58	26	26	.07	Apr. 1	306.57	7	.66
9	59.97	28	28	38.77	2	.42	10	.20
10	.82	Aug. 2	2	.02	9	305.37	12	281.90
11	.67	7	7	37.26	13	304.77	14	.60
12	.52	9	9	36.96	17	.16	15	.45
13	.37	11	11	.66	19	303.86	17	.15
14	.22	13	13	.36	24	.11	19	280.85
15	.07	15	15	.06	26	302.81	22	.40
16	58.92	17	17	35.76	27	.66	24	.10
18	.62				30	.21	25	279.95
19	.47	Nov. 2	2	329.13	May 2	301.91	27	.65
20	.32	6	6	328.53	3	.76	29	.35
26	57.42	7	7	.38	5	.46	Oct. 1	.05
30	56.82	10	10	327.93	7	.16	3	278.74
Apr. 3	.21	14	14	.33	12	300.40	6	.29
4	.06	18	18	326.72	13	.25	9	277.84
9	55.31	19	19	.57	15	299.95	11	.54
11	.01	22	22	.12	17	.65	13	.24
13	54.71	25	25	325.67	21	.05	16	276.79
14	.56	Dec. 1	1	324.77	23	298.75	17	.64
19	53.81	8	8	323.72	25	.45	19	.34
21	.51	9	9	.56	26	.30	Nov. 11	272.88
22	.36	13	13	322.96	30	297.70	13	.58
23	.21	18	18	.21	31	.55	15	.28
24	.06	20	20	321.91	June 1	.40	16	.13
26	52.75	22	22	.61	2	.24	24	270.92
28	.45	25	25	.15	4	296.94	26	.62
29	.30	27	27	320.86	7	.49	27	.47
30	.15	31	31	.20	8	.34	30	.02
May 1	.00				11	295.89	Dec. 3	269.57
2	51.85	Jan. 1865			12	.74	5	.27
3	.70	2	2	319.96	14	.44	11	268.37
5	.40	8	8	.05	17	294.99	16	267.62
8	50.95	11	11	318.60	23	.09	22	266.71
9	.80	12	12	.45	25	293.79	23	.56
10	.65	16	16	317.85	27	.48	31	265.36
11	.50	18	18	.55	28	.33		
13	.20	20	20	.25	29	.18		
17	49.60	24	24	316.65	30	.03	Jan. 1866	
19	.30	25	25	.50	July 2	292.73	3	264.91
21	48.99	27	27	.20	5	.28	5	.61
23	.69	Feb. 2	2	315.29	8	291.83	7	.31
26	.24	12	12	313.79	9	.68	9	.01
28	47.94				10	.53	14	263.25
							17	262.80



1866			July 17 235°58			July 13 181°28			Mar. 22 143°23		
Jan.	18	262°65		19	.28		15	180.98		23	.08
	22	.05	Aug.	5	232.72		16	.83		24	142.93
	23	261.90		10	231.97	Aug.	18	175.87		25	.78
	24	.75		16	.07		19	.72		26	.63
	27	.30		17	230.92	Sept.	7	172.86		27	.48
	31	260.70		20	.47		8	.71		28	.33
Feb.	5	259.94		22	.17		9	.50		29	.18
	7	.64		24	229.86		11	.26		30	.03
	15	258.44		27	.41		12	.11		31	141.88
	16	.29		28	.26		13	171.96	Apr.	1	.73
	17	.14		30	228.96		14	.81		3	.43
	22	257.39	Sept.	1	.66		15	.66		6	140.98
	26	256.79		2	.51		17	.36		8	.67
	28	.49		4	.21		18	.21		9	.52
Mar.	1	.34		22	225.50		19	.06		11	.22
	2	.18		24	.20		20	170.91		12	.07
	3	.03		27	224.75		21	.76		14	139.77
	6	255.58		29	.45	Oct.	2	169.10		15	.62
	8	.28		30	.30		3	168.95		17	.32
	10	254.98	Oct.	1	.15		4	.80		19	.02
	17	253.93		3	223.85		7	.35		21	138.72
	19	.63		5	.55		8	.20		22	.57
	22	.18		6	.40		13	167.45		24	.27
	27	252.42		7	.25		14	.30		25	.12
	30	251.97		13	222.34		16	.00		26	137.97
Apr.	2	.52		14	.19		17	166.84		28	.67
	3	.37		15	.04		18	.69		30	.37
	4	.22		16	221.89	Nov.	5	163.99	May	1	.22
	5	.07		18	.59		6	.84		3	136.91
	8	250.62		19	.44		7	.69		4	.76
	9	.47		20	.29		8	.54		9	.01
	10	.32		21	.14		11	.08		12	135.56
	11	.17		22	220.99		12	162.93		14	.26
	13	249.87		23	.84		13	.78		17	134.81
	14	.72		27	.24	Dec.	1	160.08		20	.36
	15	.57		28	.09		3	159.78		26	133.46
	17	.27	Nov.	1	219.49		4	.63		28	.15
	20	248.82		25	215.88		7	.17		29	.00
	22	.51		26	215.73		10	158.72		30	132.85
	27	247.76					26	156.32	June	2	.40
	4	246.71					28	.02		3	.25
May	15	245.06					31	155.56		4	.10
	17	244.75	1867							6	131.80
	19	.45	Jan.	2	210°16					8	.50
	20	.30	Mar.	8	200.39					10	.20
	24	243.70		14	199.48					12	130.90
	30	242.80		19	198.73					13	.75
June	1	.50		20	.58	1868				15	.45
	5	241.90		22	.28	Jan.	5	154.81		17	.15
	8	.45		24	197.98		10	.06		19	129.85
	10	.14		26	.68		11	153.91		20	.70
	12	240.84		30	.08	Feb.	1	150.75		23	.24
	16	.24	Apr.	3	196.47		5	.15		25	128.94
	18	239.94		9	195.57		8	149.70		26	.79
	20	.64		19	194.07		10	.40		27	.64
	23	.19		25	194.07		11	.25		28	.49
	25	238.89	May	23	188.95		18	148.19		30	.19
	28	.44		24	.80		22	147.59	July	1	.04
	30	.14		25	.65		23	.44		2	127.89
July	3	237.69		27	.35	Mar.	4	145.94		3	.74
	5	.38		29	.05		5	.79		4	.59
	9	236.78		31	187.75		8	.34		5	.44
	12	.33	June	3	.30		11	144.89		12	126.39
	15	235.88		4	.15		14	.43		17	125.63
			July	1	183.09		15	.28			
				3	182.79		16	.13			
				4	.64		19	143.68			



1868		Oct. 11	112°70	Apr. 29	82°62	Oct. 16	57°05
July 18	125°48	16	111.95	May 6	81.57	21	56.30
19	.33	17	.80	8	.27	25	55.70
20	.18	24	110.74	10	80.96	Nov. 2	54.49
26	124.28	27	.29	12	.66	3	.34
28	123.98	29	109.99	14	.36	4	.19
31	.53	Nov. 3	.24	20	79.46	13	52.84
Aug. 2	.23	Dec. 19	102.32	22	.16	14	.69
9	122.18	24	101.57	23	.01	19	51.94
11	121.87			24	78.86	22	.49
12	121.72			27	.41	24	.18
13	.57	1869		31	77.81	Dec. 3	49.83
14	.42	Jan. 7	99°46	June 1	.66	9	48.93
16	.12	10	.01	9	76.45	27	46.22
17	120.97	14	98.41	12	.00		
18	.82	16	.11	14	75.70		
19	.67	27	96.46	16	.40		
21	.37	29	.15	July 17	70.74	1870	
22	.22	Feb. 1	95.70	18	.59	Jan. 19	42.76
23	.07	2	.55	20	.29	22	.31
25	119.77	7	94.80	22	69.98	26	41.71
26	.62	13	93.90	25	.53	28	.41
28	.32	25	92.09	Aug. 18	65.92	31	40.96
31	118.87	28	91.64	19	.77	Feb. 7	39.90
Sept. 2	.57	Mar. 1	.49	22	.32	10	.45
5	.11	3	.19	23	.17	23	37.50
6	117.97	9	90.29	24	.02	26	.05
8	.66	12	89.84	26	64.72	Mar. 6	35.84
10	.36	16	.24	28	.42	9	.39
12	.06	17	.09	Sept. 11	62.31	14	34.64
14	116.76	18	88.94	13	.01	18	.04
15	.61	21	.48	17	61.41	24	33.14
16	.46	22	.33	19	.11	Apr. 3	31.63
17	.31	25	87.88	20	60.96	9	30.73
21	115.71	28	.43	23	.51	13	.13
26	114.96	Apr. 1	86.83	24	.36	23	28.62
28	.65	10	85.48	28	59.76	26	.17
29	.50	13	.03	30	.46	30	27.57
Oct. 1	.20	15	84.72	Oct. 2	.16	May 5	26.82
3	113.90	18	.27	6	58.55	13	25.62
5	.60	23	83.52	8	.25	19	24.71
9	.00	25	.22	11	57.80	27	23.51
						30	.06

### COMPARISON OF POSITIONS OF SPOTS OBSERVED BY PETERS WITH THOSE OBTAINED BY CARRINGTON AND AT KEW

Carrington's classic series of observations, entitled "Observations of the Spots on the Sun from November 9, 1853, to March 24, 1861, Made at Redhill" (published in 1863), overlaps that of Dr. Peters during the period from May 23, 1860, to March 24, 1861, in which interval observations were made by the two observers on the same day in fifty-two instances. Carrington's telescope had an aperture of 4.5 inches and a focal length of 52 inches. He observed transits of the projected image across bars in the focal plane inclined 45° to the direction of the diurnal motion.

The Observations made at Kew<sup>1</sup> with the photoheliograph, which in effect form a continuation of the Redhill series, were begun on February 7, 1862, and were continued for ten years. They accordingly cover the last eight years of Dr. Peters' work. The interval not included by the English observations was from March 25, 1861, to February 6, 1862, although the Kew instrument was being employed in a preliminary way during this time, so that the gap might perhaps be fairly bridged without the records of Dr. Peters. The Kew photoheliograph had an aperture of 3.5 inches and a focal length of 50 inches.

<sup>1</sup> Warren de la Rue, Balfour Stewart, and Benjamin Loewy, "Researches on Solar Physics: Heliographic Positions and Areas of Sun-Spots Observed with the Kew Photoheliograph During the Years 1862 and 1863. *Philosophical Transactions*, 159, 1-110, 1868.



Spoerer's observations, as published (1874) in his first extensive memoir, "Beobachtungen der Sonnenflecken zu Anclam," cover the period from January 1, 1861, to September 7, 1867. He first used a "3½-foot" telescope and ring micrometer; later he employed a "seven-foot" telescope, with a network of ruled lines in the focal plane.

It is thus evident that the instrument employed by Peters was superior to those of his contemporaries, and his method of reduction was not less rigorous. A comparison of his positions of spots with those obtained elsewhere on the same dates is therefore of interest. Inasmuch as Spoerer used quite different elements of the sun's axis, and a different period of rotation from those employed by the other observers here involved, a new reduction of his positions would be necessary before any comparison could be made. This comparison is therefore not feasible here.

In the case of Carrington's measures the conversion table given above serves to make the positions of Peters conform in longitude with those of Carrington, except for the difference in the value of the longitude of the node. For the purpose of comparison, 108 spots observed on fourteen days in 1860 by both Carrington and Peters were collected, only such spots being employed as could be regarded as certainly identified. The results are as follows:

#### MEAN OF DIFFERENCES, PETERS-CARRINGTON

In longitude, with respect to sign . . . . .	+ 39.2
In longitude, without respect to sign . . . . .	45.2
In latitude, with respect to sign . . . . .	+ 13.4
In latitude, without respect to sign . . . . .	28.8

Inasmuch as Carrington actually used a value for  $N$  smaller by  $47'$  than he subsequently derived from his whole series of observations, his values in longitude should be increased by that amount. Hence the outstanding mean difference in longitude, P.-C., reduced to the same longitude of node, becomes  $-8'$ . Carrington's use of  $I=7^{\circ} 10'$  instead of  $I=7^{\circ} 15'$  introduces a slight difference in the individual latitudes, but this is practically balanced in the series of observations compared.

We therefore conclude that there is no systematic difference between the positions of Carrington and Peters amounting to more than  $0^{\circ}.2$ —a satisfactory agreement. Accidental differences averaging from  $0^{\circ}.5$  to  $0^{\circ}.75$  occur, however. These differences are doubtless due, in large measure, to the fact that two observers can hardly agree in setting upon the nucleus of so indefinite an object as a sun-spot. The actual changes in the spots between the time of their observation in England and in America are also involved.

The observations at Kew and Clinton are strictly comparable, after the latter are corrected in longitude for direction and rotation-period by our conversion table. For the purpose, 114 spots measured at both stations on 21 days between February 7, 1862, and July 2, 1863, were used, with these results:

#### MEAN OF DIFFERENCES, PETERS-KEW

In longitude, with respect to sign . . . . .	+ 7.6
In longitude, without respect to sign . . . . .	19.0
In latitude, with respect to sign . . . . .	- 7.0
In latitude, without respect to sign . . . . .	17.4

We may thus infer that differences of a systematic nature amount to scarcely more than  $0^{\circ}.1$  in either co-ordinate, while the accidental differences average  $0^{\circ}.3$ . The better accordance than that in case of Carrington is presumably due to the superiority of the Kew positions. Very considerable differences, however, are seen in the Kew measurements of the same spot when two photographs were made on the same day. We find that on ten of the twenty-one days used in the comparison of Peters and Kew such duplicate observations were made at Kew, the average interval between the two plates being  $0^{\text{d}}.064$ . A comparison for 61 spots gave the following results, expressed in the sense first measure minus second measure:

In longitude, with respect to sign . . . . .	- 11.3
In longitude, without respect to sign . . . . .	17.2
In latitude, with respect to sign . . . . .	- 0.3
In latitude, without respect to sign . . . . .	9.2

The accidental differences in the longitudes of the two Kew plates are therefore practically of the same magnitude as those of Peters-Kew; while those in latitude are only one-half smaller. This clearly tends to confirm the high opinion as to the accuracy of the positions of Dr. Peters which a careful examination is certain to give to anyone.



The regret is increased that his observations could not have been published shortly after they were concluded and during his lifetime. It is evident that they are of such a degree of accuracy that they might safely be made the basis of investigations of various problems of the sun's rotation, aside from their value as records of the solar activity.

The editor acknowledges his indebtedness to his wife for assistance in reading the proofs, and to Mr. Philip Fox for aid in various ways; also to Professor Samuel J. Saunders, of Hamilton College, for his thorough but unavailing searches for the missing papers of Dr. Peters.

YERKES OBSERVATORY

THE UNIVERSITY OF CHICAGO

September, 1907







# HELIOGRAPHIC POSITIONS OF SUN-SPOTS



In the following table of observed positions of sun-spots, the time given is Clinton mean time (astronomical) for the civil date. The first column gives the current designation of the spot by a letter, as used on the author's drawings and chronograph records. Capital letters are used for groups, small letters for spots, letters with subscripts for different nuclei within the same penumbra, letters with exponents for different spots in the same group; a letter without exponent or subscript is assigned to the most conspicuous spot of the group.  $\Delta a$  is the observed difference in time between the transit of the spot and the mean of the transits of the limbs, or is the difference of right ascension of spot and center of disk.  $\Delta \delta$  is the corresponding difference in declination. In cases of large nuclei, the edges were often observed, designated by *n* and *s* for declination; the means of the  $\Delta a$  and  $\Delta \delta$  were then used in the computations. The size of the nuclei may be derived from these data. Measures were also frequently made on the margins of the penumbrae, but heliographic positions were not computed, and those measures, as well as the very infrequent measures of faculae, have been here omitted. The heliographic latitude is given in the next column under the heading *b*. In the column headed *L* is found the longitude from the node; under *L'*, the heliographic longitude. The letter in the last column serves to identify the spot on the next following date. In cases where the identification was regarded as doubtful by author or editor, the letter has been omitted.

The gap in the observations from August 17, 1863, to November 2, 1864, is not due to a deficiency in the records, but to a prolonged absence of Dr. Peters in Europe.



## OBSERVATIONS OF SUN-SPOTS

Letter	<i>Δa</i>	<i>Δδ</i>	b	L	L'	Letter on next date
1860 May 23 0 <sup>h</sup> 18 <sup>m</sup>						
<i>a</i> <sup>1</sup>	-27.1	-396"	-16° 46'	159° 0'	8° 58'	
<i>a</i>	26.1	-404	-17 31	159 39	9 37	<i>a</i>
<i>b</i> <sup>1</sup>	9.0	-225	-11 52	179 18	29 16	<i>b</i> <sup>1</sup>
<i>b</i>	6.2	-231	-12 58	181 28	31 26	<i>b</i>
<i>c</i>	2.8	+283	+15 40	194 19	44 17	<i>c</i>
<i>d</i>	+ 9.2	+378	+18 5	206 26	56 24	<i>d</i>
<i>e</i> <sup>1</sup>	9.3	-233	-17 20	194 14	44 12	<i>e</i> <sup>1</sup>
<i>e</i>	15.7	-270	-21 19	199 3	49 1	<i>e</i>
<i>e</i> <sup>2</sup>	21.8	-270	-23 0	204 29	54 27	<i>e</i> <sup>2</sup>
<i>f</i>	37.8	+485	+16 55	236 56	86 54	<i>f</i>
<i>g</i> <sup>1</sup>	48.2	+ 25	-12 26	235 13	85 11	<i>g</i> <sup>1</sup>
<i>g</i> <sup>2</sup>	52.7	+ 25	-13 34	240 58	90 56	<i>g</i> <sup>2</sup>
<i>g</i>	52.7	- 23	-16 24	240 24	90 22	<i>g</i>
<i>h</i>	54.7	+413	+ 8 31	256 30	106 28	<i>h</i>
<i>i</i>	65.5	+129	-10 24	267 55	117 53	<i>i</i>
May 24 0 <sup>h</sup> 18 <sup>m</sup>						
<i>a</i>	-37.4	-452	-17 11	145 40	9 41	<i>a</i>
<i>b</i> <sup>1</sup>	22.9	-294	-12 2	164 59	29 0	<i>b</i>
<i>b</i>	20.5	-287	-12 24	167 39	31 40	<i>b</i> <sup>1</sup>
<i>c</i>	17.2	+226	+16 23	180 4	44 5	<i>c</i>
<i>d</i>	5.3	+313	+18 21	191 43	55 44	
<i>e</i> <sup>1</sup>	5.3	-301	-17 14	179 44	43 45	
<i>e</i>	+ 2.0	-317	-20 11	185 25	49 26	<i>e</i>
<i>e</i> <sup>2</sup>	9.0	-336	-23 16	191 2	55 3	<i>e</i> <sup>4</sup> ?
<i>f</i>	26.8	+440	+17 23	222 49	86 50	<i>f</i>
<i>g</i> <sup>1</sup>	36.3	- 35	-12 36	220 32	84 33	
<i>g</i>	42.8	- 63	-15 54	226 55	90 56	<i>g</i>
<i>g</i> <sup>2</sup>	43.0	- 14	-13 5	227 45	91 46	
<i>h</i>	46.7	+380	+ 8 49	241 42	105 43	<i>h</i>
<i>i</i>	61.0	+112	-10 3	254 24	118 25	<i>k</i>
<i>i</i> <sup>1</sup>	63.4	+119	-10 12	260 8	124 9	<i>k</i> <sup>1</sup>
May 25 0 <sup>h</sup> 33 <sup>m</sup>						
<i>a</i>	-46.4	-498	-17 32	131 20	9 32	<i>d</i> <sup>1</sup>
<i>b</i>	36.3	-356	-12 4	149 45	27 57	
<i>b</i> <sup>1</sup>	33.7	-347	-12 15	152 39	30 51	
<i>c</i>	31.2	+165	+16 37	165 33	43 45	
<i>d</i>	17.4	+276	+19 31	179 39	57 51	
<i>d</i> <sup>1</sup>	14.6	+304	+20 27	182 35	60 47	<i>a</i>
<i>e</i> <sup>1</sup>	23.7	-304	-12 27	163 12	41 24	
<i>e</i> <sup>2</sup>	19.5	-304	-13 34	166 49	45 1	
Letter	<i>Δa</i>	<i>Δδ</i>	b	L	L'	Letter on next date
<i>e</i> <sup>3</sup>	-11.3	-374"	-19° 55'	172° 1'	50° 13'	<i>C</i>
<i>e</i>	11.4	-393	-21 3	171 24	49 36	
<i>e</i> <sup>4</sup>	5.0	-382	-22 11	177 17	55 29	
<i>f</i>	+14.2	+379	+17 6	208 37	86 49	<i>d</i>
<i>g</i>	30.2	-120	-15 46	212 39	90 51	
<i>h</i>	35.8	+330	+ 8 53	226 49	105 1	<i>e</i>
<i>i</i>	49.2	+605	+22 21	261 33	139 45	<i>g</i>
<i>k</i>	53.1	+ 72	- 9 25	240 9	118 21	<i>f</i> <sup>1</sup>
<i>k</i> <sup>1</sup>	56.7	+108	- 8 57	246 0	124 12	<i>f</i> <sup>3</sup>
May 29 0 <sup>h</sup> 18 <sup>m</sup>						
<i>a</i>	-58.9	+129	+21 24	127 29	61 40	<i>a</i>
<i>b</i>	58.1	-427	-11 19	111 36	45 47	
<i>c</i>	53.8	-534	-18 44	110 43	44 54	
<i>c</i> <sup>1</sup>	53.0	-519	-18 4	114 38	48 49	
<i>d</i> <sup>1</sup>	46.7	+ 99	+19 31	127 48	61 59	
<i>d</i>	41.3	+114	+15 55	150 46	84 57	<i>b</i>
<i>e</i>	21.0	+ 77	+ 8 44	169 25	103 36	
<i>f</i>	+0.3	-183	-11 20	182 24	116 35	
<i>f</i> <sup>1</sup>	1.3	-160	-10 15	183 39	117 50	
<i>f</i> <sup>3</sup>	7.9	-138	-10 31	189 26	123 37	
<i>f</i> <sup>4</sup>	8.6	-112	- 5 57	194 27	128 38	<i>c</i>
<i>g</i>	5.8	+368	+19 38	196 52	131 3	
<i>g</i> <sup>1</sup>	14.6	+473	+23 58	207 24	141 35	
<i>h</i>	37.1	-331	-29 34	214 27	148 38	
<i>i</i>	64.3	+ 63	-11 45	255 39	189 50	
June 3 0 <sup>h</sup> 18 <sup>m</sup>						
<i>a</i>	-67.5	- 84	+ 9 8	99 20	103 41	<i>a</i>
<i>b</i>	58.0	-402	-11 32	110 16	114 37	
<i>b</i> <sup>1</sup>	54.5	-350	- 9 11	119 57	124 18	
<i>c</i>	56.3	+160	+21 27	126 39	131 0	
<i>d</i>	22.4	+175	+14 55	164 22	168 43	
<i>e</i> <sup>1</sup>	+ 1.4	-246	-14 50	177 57	182 18	<i>c</i>
<i>e</i> <sup>2</sup>	1.6	-208	-12 36	178 44	183 5	
<i>e</i> <sup>3</sup>	3.3	-272	-16 48	179 5	183 26	
<i>e</i>	10.1	-170	-12 7	186 17	190 38	
<i>e</i> <sup>4</sup>	11.3	-258	-17 42	186 7	190 28	
<i>e</i> <sup>5</sup>	17.4	-151	-11 34	192 42	197 3	<i>d</i> <sup>1</sup>
<i>f</i> <sup>1</sup>	3.0	+486	+28 56	191 8	195 29	
<i>f</i>	9.4	+528	+30 5	198 5	203 7	
<i>f</i> <sup>2</sup>	14.9	+488	+26 11	202 33	206 54	
<i>g</i>	49.3	+458	+16 40	238 52	243 13	
<i>h</i> <sup>1</sup>	63.0	-101	-19 19	246 30	250 51	<i>e</i>
<i>h</i>	63.1	- 26	-14 48	246 40	251 1	

Letter	<i>4a</i>	<i>4δ</i>	<i>b</i>	<i>L</i>	<i>L'</i>	Letter on next date
1860 June 4 0 <sup>h</sup> 51 <sup>m</sup>						
<i>a</i>	-63.2	+136''	+21° 10'	112° 31'	131° 14'	
<i>b</i>	37.6	+124	+15 0	148 29	167 12	<i>a</i>
<i>c</i>	14.1	-313	-15 34	162 49	181 32	<i>b</i>
<i>c</i>	5.4	-226	-12 8	171 45	190 28	<i>c</i>
<i>d</i>	12.4	+424	+28 24	175 11	193 54	
<i>d</i>	10.2	+439	+28 53	177 26	196 9	
<i>d</i>	8.4	+463	+30 5	179 30	198 13	
<i>d</i>	3.0	+479	+29 53	184 54	203 37	
<i>e</i>	+40.3	+417	+16 29	224 16	242 59	
<i>e</i>	43.1	+426	+16 27	227 55	246 38	
<i>f</i>	55.4	- 87	-16 25	231 56	250 39	
<i>f</i>	55.4	-138	-19 32	231 58	250 41	
<i>g</i>	66.8	- 58	-17 5	256 15	274 58	
June 5 3 <sup>h</sup> 37 <sup>m</sup>						
<i>a</i>	-51.2	+ 96	+15 40	131 51	166 13	
<i>a</i>	48.2	+125	+17 4	135 42	170 4	<i>a</i>
<i>b</i>	29.7	-355	-14 59	146 55	181 17	<i>b</i>
<i>b</i>	26.5	-381	-17 13	149 15	183 37	<i>b</i>
<i>b</i>	21.5	-273	-11 41	156 20	190 42	
<i>b</i>	21.4	-355	-16 39	154 36	188 58	
<i>c</i>	27.8	+376	+28 43	158 32	192 54	
<i>c</i>	23.3	+412	+30 8	163 16	197 38	
<i>c</i>	18.3	+429	+30 10	168 20	202 42	
<i>c</i>	16.5	+436	+30 13	170 10	204 32	
<i>c</i>	16.5	+461	+31 54	170 26	204 48	
<i>d</i>	+28.1	+376	+16 54	209 17	243 39	
<i>d</i>	31.5	+392	+17 11	213 1	247 23	
<i>e</i>	43.0	-134	-16 16	215 18	249 40	
<i>e</i>	44.3	-172	-18 52	216 37	250 59	
<i>f</i>	61.4	- 73	-16 23	240 59	275 21	
<i>f</i>	63.9	- 49	-15 26	246 17	280 39	
June 6 0 <sup>h</sup> 28 <sup>m</sup>						
<i>a</i>	-56.8	+ 95	+16 44	123 9	168 42	
<i>b</i>	41.3	-381	-14 25	133 31	179 4	
<i>b</i>	39.5	-391	-15 23	135 9	180 42	
<i>b</i>	36.9	-414	-17 17	137 11	182 44	
<i>b</i>	32.9	-312	-11 52	144 16	189 49	
<i>c</i>	38.6	+335	+28 17	145 48	191 21	
<i>c</i>	34.2	+374	+29 57	150 40	196 13	
<i>c</i>	29.8	+393	+30 16	155 30	201 3	
<i>c</i>	27.5	+400	+30 14	157 56	203 29	
<i>c</i>	26.6	+428	+31 58	158 54	204 27	
<i>c</i>	17.3	+361	+25 30	167 37	213 10	
<i>d</i>	+16.6	+337	+17 5	196 57	242 30	
<i>d</i>	20.3	+363	+17 57	200 47	246 20	
<i>e</i>	31.3	-177	-16 14	202 17	247 50	
June 11 0 <sup>h</sup> 34 <sup>m</sup>						
<i>a</i>	-63.3	+239	+25 22	102 25	219 11	
<i>b</i>	49.9	+140	+17 6	127 33	244 19	<i>a</i>
<i>c</i>	34.4	+157	+15 44	144 37	261 23	<i>b</i>
<i>c</i>	29.4	+160	+15 6	149 30	266 16	<i>c</i>
<i>d</i>	15.6	-345	-17 19	155 15	272 1	<i>c</i>
<i>d</i>	13.8	-363	-18 44	156 27	273 13	<i>c</i>
<i>e</i>	+ 0.8	+265	+16 35	176 49	293 35	
<i>e</i>	3.4	+270	+16 28	179 8	295 54	
<i>f</i>	29.9	-107	-10 21	197 6	313 52	<i>d</i>
<i>g</i>	37.3	-144	-13 51	203 57	320 43	<i>d</i>
<i>g</i>	37.6	-122	-12 33	204 22	321 8	
June 12 0 <sup>h</sup> 32 <sup>m</sup>						
<i>a</i>	-60.5	+ 96	+15 41	110 54	241 41	
<i>a</i>	58.8	+124	+17 10	113 43	244 30	<i>a</i>
<i>b</i>	45.8	+121	+15 7	131 31	262 18	<i>b</i>
<i>b</i>	43.9	+112	+14 17	133 38	264 25	<i>b</i>
<i>b</i>	40.9	+153	+16 21	136 57	267 44	<i>b</i>
<i>c</i>	30.9	-387	-17 35	139 21	270 8	<i>c</i>
<i>c</i>	29.4	-378	-17 15	141 2	271 49	<i>c</i>
<i>c</i>	27.7	-401	-19 57	142 44	273 31	<i>c</i>
<i>d</i>	+15.9	-143	- 9 59	183 38	314 25	<i>e</i>
<i>d</i>	24.7	-179	-13 35	191 1	321 48	<i>e</i>
<i>e</i>	26.1	-378	-26 26	191 23	322 10	
<i>e</i>	27.8	-347	-26 37	190 30	321 17	
<i>e</i>	29.0	-385	-28 12	193 17	324 4	
<i>f</i>	55.8	-338	-29 24	228 44	359 31	<i>g</i>
<i>g</i>	60.7	-160	-18 43	233 40	4 27	
June 13 0 <sup>h</sup> 30 <sup>m</sup>						
<i>a</i>	-65.0	+124	+17 36	99 42	244 31	
<i>a</i>	65.0	+155	+19 31	98 50	243 39	
<i>b</i>	57.3	+114	+16 4	115 12	260 1	<i>a</i>
<i>b</i>	55.5	+107	+15 24	118 0	262 49	<i>a</i>
<i>b</i>	51.6	+155	+17 50	123 17	268 6	
<i>b</i>	51.6	+133	+16 28	123 22	268 11	
<i>c</i>	42.9	-408	-17 21	125 0	269 49	
<i>c</i>	40.8	-398	-17 1	127 47	272 36	<i>b</i>
<i>c</i>	40.0	-438	-19 39	127 17	272 6	
<i>d</i>	28.9	+191	+16 49	147 59	292 48	
<i>e</i>	0.9	-179	- 9 23	168 24	313 13	<i>c</i>
<i>e</i>	+ 6.8	-169	- 9 57	174 52	319 41	
<i>f</i>	36.2	-181	-15 17	200 58	345 47	<i>d</i>
<i>f</i>	39.8	-157	-14 25	204 47	349 36	<i>d</i>



Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1860 June 13—Continued						
$f_1$	+39 <sup>s</sup> 8	-167''	-15° 2'	204° 45'	349° 34'	
$g$	46.7	-368	-29 15	214 11	359 0	
$h$	65.8	-102	-15 40	243 53	28 42	$f$
$h^1$	66.7	-119	-16 56	247 27	32 16	$f^1$
June 14 0 <sup>h</sup> 14 <sup>m</sup>						
$a$	-64.4	+ 93''	+15° 16'	100° 44'	259° 25'	
$a^1$	60.4	+ 95	+14 58	109 9	267 50	
$a^2$	59.9	+133	+17 14	109 40	268 21	$a$
$b$	50.6	-429	-17 57	113 1	271 42	$b$
$c^1$	15.2	-217	- 9 34	155 9	313 50	$r$
$c$	13.1	-255	-12 10	156 24	315 5	$c$
$c^1$	7.4	-278	-14 22	160 56	319 37	$c^2$
$d^1$	+21.4	-236	-16 4	185 58	344 39	$d$
$d$	26.3	-217	-15 39	190 34	349 15	$d$
$e$	58.1	+408	-16 39	240 32	39 13	$j$
$f$	60.4	-152	-17 16	231 6	29 47	$g$
$f^1$	61.8	-15	-17 51	233 59	32 59	$g^1$
June 15 0 <sup>h</sup> 21 <sup>m</sup>						
$a$	-65.7	+122	+16 46	95 32	268 19	
$b$	57.2	-431	-17 44	99 51	272 38	
$c^1$	29.9	-256	-10 1	140 39	313 26	
$c$	28.7	-276	-11 24	141 26	314 13	$a$
$c^2$	21.9	-309	-14 19	147 2	319 49	
$d$	+ 5.6	-261	-15 6	171 16	344 3	$d^1$
$d^1_1$	11.5	-253	-15 27	176 23	349 10	$d^2$
$d^1_2$	11.7	-263	-16 5	176 28	349 15	$d$
$e$	46.4	+351	+15 39	217 49	30 36	$f^1$
$f$	51.9	+391	+17 11	226 54	39 41	$h$
$g$	51.3	-179	-16 55	216 22	29 9	$g$
$g^1$	53.5	-180	-17 22	219 23	32 10	
$h$	58.3	+454	+19 50	244 58	57 45	$i$
$h^1$	59.4	+456	+19 42	249 39	62 26	$i^1$
June 16 2 <sup>h</sup> 23 <sup>m</sup>						
$a$	-43.0	-294	-10 56	125 47	313 48	$a$
$b^1$	26.8	-494	-25 37	137 14	325 15	
$b$	24.4	-501	-26 24	139 28	327 29	
$c^1$	14.0	+230	+17 8	148 26	336 27	
$c$	12.2	+237	+17 20	160 0	348 1	
$d^1$	11.2	-298	-15 1	155 45	343 46	$b$
$d^2$	5.2	-291	-15 22	160 55	348 56	$c^1$
$d$	4.6	-298	-15 53	161 21	349 22	$c$
$e$	+11.8	-301	-18 17	175 20	3 21	$d$
$f$	33.4	+317	+11 28	189 59	18 0	
$f^1$	35.5	+329	+16 24	203 52	31 53	
Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$g$	+39 <sup>s</sup> 0	-214''	-16° 47'	201° 13'	29° 14'	$g^2$
$h$	41.3	+350	+16 49	210 43	38 44	$h$
$i$	53.2	+430	+19 48	230 14	58 15	$i$
$i^1$	56.0	+439	+19 51	236 22	64 23	$i^2$
June 17 0 <sup>h</sup> 54 <sup>m</sup>						
$a$	-53.1	-298	-10 24	112 12	313 23	
$b$	24.8	-324	-15 5	142 30	343 41	$a$
$c^1$	19.5	-319	-15 20	147 22	348 34	
$c$	18.7	-324	-15 43	148 1	349 12	$b$
$d$	4.6	-329	-17 47	160 13	1 24	$c$
$e$	+ 2.1	-352	-20 6	165 46	6 57	$c^1$
$f$	11.2	-385	-23 28	173 30	14 41	
$g$	22.1	-324	-21 2	183 48	24 59	
$g^1$	24.7	-263	-17 30	186 20	27 31	D
$g^2$	26.3	-242	-16 25	187 56	29 7	
$h$	30.3	+322	+17 2	197 34	38 46	$e$
$i$	46.1	+406	+19 54	217 32	58 43	$f$
$i^1$	48.3	+450	+22 18	222 40	63 51	$f^1$
$i^2$	50.9	+413	+19 34	224 32	65 42	$f^2$
$k$	63.5	-142	-15 54	234 40	75 51	$g$
$k^1$	64.6	-126	-15 6	237 3	78 14	
June 18 0 <sup>h</sup> 14 <sup>m</sup>						
$a$	-38.4	-343	-14 50	127 57	342 47	$a$
$b$	32.0	-348	-15 40	134 24	349 14	$b$
$c$	17.8	-355	-17 49	147 32	2 22	$c$
$c^1$	11.0	-387	-20 39	153 6	7 56	$dd^1$
$d$	+ 6.1	-366	-21 24	168 21	23 11	$f$
$d^1$	11.9	-353	-21 19	173 37	28 27	
$d^2$	14.4	-308	-18 46	176 6	30 56	
$d^3$	17.0	-254	-14 52	178 2	32 52	
$e$	17.0	+286	+16 52	183 40	38 30	
$f$	36.3	+373	+19 40	203 55	58 45	$h$
$f^1$	39.9	+408	+21 21	208 59	63 49	
$f^2$	42.8	+371	+18 36	211 9	65 59	$h^3$
$g$	56.0	-159	-15 14	220 6	74 56	$i$
June 19 0 <sup>h</sup> 38 <sup>m</sup>						
$a$	-49.7	-353	-14 41	113 25	342 30	$a$
$b$	44.3	-364	-15 49	119 56	349 1	
$c$	33.0	-376	-17 37	131 57	1 2	$b$
$d$	26.1	-406	-20 14	138 5	7 10	
$d^1$	25.0	-422	-21 24	138 48	7 53	
$e$	17.9	-301	-14 27	147 27	16 32	$c$
$e^1$	14.8	-298	-14 36	150 13	19 18	$c^1$
$f$	9.4	-392	-21 10	153 41	22 46	
$g$	9.4	+251	+18 1	159 23	28 28	
$h$	+23.8	+341	+19 41	189 45	58 50	$e$

Letter	$\Delta a$	$\Delta \delta$	b	L	L	Letter on next date	Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1860 June 19—Continued													
$h^1$	+24.9	-411"	+23° 58'	192° 20'	61° 25'	$e^3$	$f^2$	+25.2	-438"	-26° 27'	179° 33'	160° 54'	$e^2$
$h^2$	29.1	+415	+23 40	196 37	65 42	$e^5$	$f^3$	29.6	-461	-28 27	184 23	165 44	$e^3$
$h^3$	31.7	+336	+18 21	197 16	66 21	$e^6$	$g$	24.7	+193	+12 45	180 7	161 28	$g_1$
$i$	45.1	-190	-15 7	205 21	74 26	$f$	$g^1$	26.0	+193	+12 39	181 17	162 38	$g_2$
$k$	52.5	+581	+30 48	242 3	111 8	$h$	$g^2$	28.3	+230	+14 43	183 54	165 15	$g^1$
$l$	62.6	+326	+13 9	241 26	110 31	$k$	$g^3$	32.3	+228	+14 17	187 43	169 4	$g^2$
June 20 2 <sup>h</sup> 45 <sup>m</sup>							$g^4$	33.7	+216	+13 26	188 55	170 16	$g^3$
$a$	-58.4	-349	-14 14	98 26	343 23		$g^5$	34.6	+221	+13 40	189 50	171 11	$g^4$
$b$	45.7	-398	-18 10	116 9	1 6		$h$	24.2	+371	+23 52	182 9	163 30	$h$
$c$	34.9	-325	-14 24	130 16	15 13		$h^1$	27.2	+313	+19 57	184 4	165 25	$h^1$
$c^1$	31.0	-325	-14 45	134 8	19 5		$h^2$	28.0	+399	+25 21	186 30	167 51	$h^2$
$d$	22.4	+236	+18 45	146 44	31 41		$h^3$	29.2	+478	+30 28	189 51	171 12	$h^3$
$e$	8.7	+311	+19 54	174 26	59 23	$a$	$h^4$	34.8	+445	+27 45	195 0	176 21	$h^4$
$e^1$	8.5	+402	+25 43	175 28	60 25		$i^1$	42.4	-278	-17 24	196 5	177 26	
$e^2$	9.0	+379	+24 11	175 33	60 30	$a^1$	$i^2$	45.6	-263	-16 45	199 38	180 59	$f^1?$
$e^3$	10.9	+393	+24 51	177 32	62 29		$i^3$	47.5	-186	-12 6	201 16	182 37	$f^2$
$e^5$	15.4	+391	+24 12	181 39	66 36	$a^2?$	$i^4$	50.6	-315	-20 40	206 55	188 16	
$e^6$	17.4	+304	+18 28	182 4	67 1		$i$	52.2	-172	-11 43	207 4	188 25	$f$
$f$	30.8	-198	-13 23	189 37	74 34		$k^1$	54.1	+461	+26 33	223 44	205 5	$i^1$
$g$	40.2	-278	-19 36	199 16	84 13		$k^2$	57.1	+450	+25 21	229 52	211 13	$i$
$h$	47.9	+566	+29 23	225 13	110 10	$D?$	$k$	57.3	+477	+26 58	233 53	215 14	$i^3$
$i$	50.3	-219	-17 14	210 52	95 49	$B$	$k^3$	58.3	+427	+23 44	230 49	212 10	$i^4$
$k$	57.1	+295	+12 47	226 1	110 58	$C$	$k^4$	60.9	+380	+20 24	233 43	215 4	
$l^1$	62.8	-285	-23 37	235 11	120 8		June 28 0 <sup>h</sup> 46 <sup>m</sup>						
$l^2$	64.3	-276	-23 21	239 45	124 42		$a$	-60.4	-396	-20 28	82 45	78 13	
$l$	65.3	-224	-20 7	239 59	124 56		$a^1$	57.9	-327	-15 40	93 37	89 5	
$m$	67.2	-134	-14 46	243 18	128 15	$E$	$a^2$	56.9	-394	-20 4	92 5	87 33	
June 27 0 <sup>h</sup> 36 <sup>m</sup>							$a^3$	54.2	-336	-16 9	99 46	95 14	
$a$	-64.9	+258	+20 17	78 55	60 16		$a^4$	52.1	-336	-16 8	103 0	98 28	
$a^1$	63.8	+317	+23 59	77 55	59 16		$a^5$	51.0	-373	-18 32	103 19	98 47	
$a^2$	61.5	+334	+25 16	84 40	66 1		$b^1$	54.1	+228	+18 27	102 49	98 17	
$b$	55.0	-410	-20 43	95 47	77 8	$a$	$b$	49.2	+123	+11 59	110 52	106 20	$a^2$
$b^1$	49.3	-401	-22 8	98 12	79 33	$a^2$	$c$	38.4	+447	+32 30	118 16	113 44	$b$
$b^2$	48.9	-336	-15 50	108 19	89 40	$a^1$	$d$	23.2	-305	-14 44	135 18	130 46	
$b^3$	41.8	-346	-16 37	116 46	98 7	$a^4$	$d^1$	20.6	-359	-18 17	137 5	132 33	
$b^4$	39.9	-383	-19 3	118 3	99 24	$a^5$	$d^2$	15.2	-368	-19 5	141 55	137 23	
$c^1$	41.0	+232	+18 45	120 26	101 47	$b^1$	$d^3$	9.1	-332	-17 3	147 38	143 6	
$c$	37.0	+122	+11 51	125 23	106 44	$b$	$d^4$	6.6	-334	-17 16	149 48	145 16	
$d$	28.4	+450	+32 30	131 20	112 41	$c$	$e$	+3.5	-486	-27 59	158 4	153 32	$d$
$d^1$	27.6	+445	+32 7	132 16	113 37		$e^1$	9.0	-479	-27 50	163 16	158 44	$d^1?$
$e^1$	9.8	-268	-13 0	148 18	129 39		$e^2$	12.0	-440	-25 21	166 4	161 32	
$e$	8.1	-294	-14 43	149 35	130 56	$d$	$e^3$	16.6	-451	-26 25	170 26	165 54	
$e^2$	0.9	-356	-19 5	155 26	136 47	$d^2$	$f^1$	31.9	-296	-17 17	184 24	179 52	$g^1$
$f$	+18.7	-466	-27 49	173 13	154 34	$e$	$f^2$	35.1	-212	-12 14	187 10	182 38	$g^2$
$f^1$	22.1	-466	-28 6	176 36	157 57	$e^1$	$f$	40.7	-195	-11 38	192 50	188 18	$g$
							$f^3$	40.7	-289	-17 34	193 32	189 0	$g^4$
							$f^4$	46.2	-308	-19 19	200 12	195 40	$g^5$
							$g_1$	10.3	+172	+12 40	166 17	161 45	$f_1$
							$g_2$	11.1	+177	+12 56	167 0	162 28	$f_2$
							$g^1$	14.1	+207	+14 35	169 49	165 17	$f^1$



Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1860 June 28—Continued						
$g^2$	+18 <sup>s</sup> 3	+212''	+14° 37'	173° 33'	169° 1'	$f^2?$
$g^3$	21.0	+207	+14 9	175 55	171 23	
$h$	8.7	+355	+24 11	166 15	161 43	$e$
$h^1$	11.3	+287	+19 42	168 0	163 27	
$h^2$	13.7	+357	+24 0	170 52	166 20	$e^1$
$h^3$	15.8	+380	+25 21	173 7	168 35	$c^2$
$h^4$	17.4	+451	+29 55	175 45	171 13	
$h^5$	21.1	+391	+25 41	178 22	173 50	
$h^6$	24.0	+398	+25 55	181 20	176 48	
$i^1$	46.8	+442	+26 44	209 4	204 32	$h^1$
$i^2$	49.7	+451	+26 59	214 1	209 29	$h^2?$
$i$	53.3	+459	+27 0	221 0	216 28	$h$
$i^3$	53.3	+405	+23 37	217 25	212 53	$h^4$
$i^4$	55.0	+362	+20 43	218 5	213 33	$h^3$
$i^5$	57.9	+378	+21 17	224 45	220 13	$i$
June 30 0 <sup>h</sup> 7 <sup>m</sup>						
$a$	-65.6	+265	+19 12	70 39	93 49	
$a^1$	64.7	+280	+20 18	74 13	97 23	
$a^2$	63.8	+141	+12 6	85 2	108 12	
$b$	53.4	+465	+33 5	91 20	114 30	
$c^1$	48.2	-350	-17 33	106 22	129 32	
$c$	42.2	-359	-18 6	113 35	136 45	
$c^2$	40.2	+301	-14 23	116 58	140 8	
$d$	24.1	-504	-28 4	129 57	153 7	
$d^1$	16.2	-495	-27 38	138 4	161 14	
$e$	20.4	+320	+23 24	137 16	160 26	$b$
$e^1$	15.1	+341	+24 36	142 10	165 20	
$e^2$	9.8	+354	+25 16	147 5	170 15	$b^1$
$e^3$	3.3	+391	+27 27	153 12	176 22	$b^3$
$f_1$	18.7	+153	+12 56	139 21	162 31	$a$
$f_2$	18.4	+158	+13 14	139 36	162 46	
$f^1$	15.6	+183	+14 41	142 3	165 13	
$f^2$	10.3	+202	+15 42	146 44	169 54	$a^1$
$g^1$	+ 1.2	-317	-16 23	155 4	178 14	
$g^2$	6.9	-230	-10 54	154 55	178 5	
$g^3$	6.9	-348	-17 51	160 1	183 12	
$g$	12.8	-223	-11 0	165 13	188 23	$c_2$
$g^4$	17.8	-322	-16 4	168 33	191 43	$c$
$g^5$	22.8	-334	-18 33	174 18	197 28	$c^3$
$h^1$	26.7	+401	+26 30	181 59	205 9	$d$
$h^2$	28.9	+417	+27 24	184 34	207 44	
$h^3$	34.3	+327	+21 15	188 22	211 32	$d^2$
$h^4$	35.2	+375	+24 14	190 20	213 30	$d^4$
$h$	37.8	+428	+27 28	194 47	217 57	$d^5 d^6$
$i$	42.5	+336	+21 12	197 38	220 48	
$k^1$	47.8	+214	+13 14	201 13	224 23	$e$
$k^2$	50.4	+172	+10 29	203 37	226 47	
Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$k$	+53 <sup>s</sup> 8	+251''	+14° 55'	210° 3'	233° 13'	$e^3$
$l$	63.6	+312	+17 12	234 3	257 13	$f$
$m$	65.0	-228	-15 44	230 25	253 35	$g^1$
July 4 2 <sup>h</sup> 23 <sup>m</sup>						
$a$	-62.6	+170	+12 21	82 41	163 18	
$a^1$	58.0	+218	+15 40	90 15	170 52	
$b$	60.2	+340	+22 45	80 4	160 41	
$b^1$	54.6	+371	+25 24	90 12	170 49	
$b^2$	53.3	+359	+24 45	93 9	173 46	
$b^3$	50.0	+403	+27 48	96 36	177 13	
$b^4$	48.7	+405	+27 59	98 10	178 47	$b$
$c^1$	51.0	-293	-15 7	100 32	181 9	$a^1$
$c$	46.5	-246	-11 55	107 7	187 44	$a$
$c^2$	42.0	-340	-17 46	110 50	191 27	$a^2$
$c^3$	35.6	-345	-17 53	117 51	198 28	$a^3$
$d^1$	29.7	+352	+25 10	123 0	203 37	
$d^s$	27.7	+394				
$d_n$	25.7	+352	+26 35	125 47	206 24	$d$
$d^2$	22.8	+286	+21 10	130 37	211 14	$d^1$
$d^3$	21.4	+352	+25 16	131 22	211 59	$d^2$
$d^4$	19.4	+340	+25 10	133 15	213 52	$d^3$
$d^5$	13.3	+382	+27 15	138 55	219 32	$d^4$
$d^6$	12.1	+382	+27 16	140 3	220 40	$d^5$
$e^1$	24.5	+ 78	+ 8 16	130 7	210 44	$c^1$
$e^2$	15.7	+ 83	+ 8 36	137 54	218 31	$c^2$
$e$	9.8	+152	+12 46	142 50	223 27	$c$
$e^3$	0.3	+185	+14 43	151 1	231 38	$c^4$
$f$	+27.1	+222	+16 22	175 33	256 10	$q$
$g^1$	26.9	-312	-16 14	174 47	255 24	$f_1$
$g$	28.5	-319	-16 45	176 21	256 58	$f_2$
$g^2$	33.9	-298	-15 38	181 35	262 12	$f^1$
$h$	59.6	-352	-21 10	218 42	299 19	$h$
July 6 0 <sup>h</sup> 27 <sup>m</sup>						
$a^1$	-64.6	-263	-15 24	71 36	179 10	
$a$	62.8	-209	-11 28	80 22	187 56	$a$
$a^2$	59.3	-315	-17 54	84 11	191 45	$b$
$a^3$	55.8	-315	-17 30	90 52	198 26	
$b$	58.7	+439	+28 24	72 38	180 12	
$c^1$	51.0	+ 85	+ 7 33	100 52	208 26	$c^1$
$c^2$	46.1	+ 99	+ 8 39	106 36	214 10	$c^2$
$c$	37.5	+167	+13 9	115 12	222 46	$c$
$c^3$	35.2	+130	+10 59	117 50	225 24	
$c^4$	28.6	+186	+14 36	123 49	231 23	
$d^s$	47.7	+370				
$d_n$	45.7	+416	+26 47	99 37	207 11	$d$
$d^1$	45.1	+320	+22 14	104 5	211 39	$d^1$
$d^2$	43.3	+370	+25 32	104 56	212 30	

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date	Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1860 July 6—Continued													
$d^3$	-42.50	+359''	+24° 54'	106° 53'	214° 27'	$d^2$	$a^1$	-60.50	+359''	+22° 46'	74° 10'	209° 56'	
$d^4$ <sup>n</sup>	35.9	+410					$a^2$	57.0	+396	+25 14	79 17	215 3	b
$d^5$ <sup>s</sup>	35.9	+382	+27 34	113 8	220 42	$d^3$	$a^3$ <sup>s</sup>	52.9	+412	+28 14	86 31	222 17	$b^1$
$e$	35.1	+412					$b$	51.5	+454				
$f_1$	35.1	+389	+27 55	113 56	221 30	$d^4$	$c^1$	57.9	+201	+13 18	86 46	222 32	a
$f_2$	35.2	-308	-16 8	117 7	224 41	$e$	$c$	31.7	+218	+16 13	118 20	254 6	$c^1$
$g$	1.1	-325	-16 14	148 26	256 0	$f_1$	$d$	28.7	+234	+17 19	121 6	256 52	c
$g^1$	+0.6	+334	-16 49	149 50	257 24	$f_2$	$d^1$	30.0	-310	-15 57	120 46	256 32	d
$g^2$	5.3	-315	-15 37	153 54	261 28	$h^1$	$e$	28.7	-326	-16 56	121 50	257 36	$d^1$
$h^1$	-0.5	+216	+16 50	148 50	256 24	$h$	$e^1$	+18.4	-410	-21 28	164 36	300 22	e
$h^2$	+0.8	+174	+14 15	149 57	257 31	$i$	$e^2$	24.8	-422	-22 19	170 54	306 40	$e^1$
$h^3$	3.2	+207	+16 16	152 3	259 37		$f$	27.6	-470	-25 38	174 26	310 12	
$h^4$	41.7	-414	-22 58	190 34	298 8		$f^1$	36.8	+241	+18 29	181 30	317 16	f
$i$	43.7	-394	-21 44	192 30	300 4		$f^2$	40.3	+182	+14 46	184 31	320 17	$f^2?$
	46.1	-424	-23 56	196 36	304 10		$j^2$	41.3	+255	+19 14	186 36	322 22	$f^1$
	48.3	-398	-22 18	198 45	306 19		July 9 0 <sup>h</sup> 44 <sup>m</sup>						
	49.3	-440	-25 18	201 52	309 26		a	-63.6	+218	+13 3	72 43	222 33	
	57.2	+263	+17 58	210 19	317 53		b	60.2	+415	+26 15	66 12	216 2	
July 7 1 <sup>h</sup> 9 <sup>m</sup>							$b^1$ <sup>s</sup>	57.6	+424				
a	-66.2	-188	-11 20	68 29	190 29		$b^1$ <sup>n</sup>	56.1	+468	+28 53	74 5	223 55	
b	63.8	-291	-17 34	71 31	193 31		$c^1$	44.2	+227	+16 29	104 0	253 50	$a^?$
$c^1$	60.4	+103	+7 30	85 27	207 27		c	41.9	+246	+17 9	106 10	256 0	$a^1$
$c^2$	56.8	+118	+8 46	91 15	213 15		$c^2$	40.3	+204	+14 41	108 23	258 13	
c	49.4	+183	+13 16	100 32	222 32	b	d	42.4	-304	-16 29	106 50	256 40	
$d^s$	55.3	+388				a	$d^1$	41.4	-320	-17 26	107 52	257 42	b
$d^n$	53.3	+425	+26 38	85 23	207 23		e	+4.3	-412	-21 30	150 58	300 48	d
$d^1$	54.1	+342	+22 37	89 8	211 8	$a^1$	$e^1$	9.1	-435	-22 58	155 27	305 17	$d^2$
$d^2$	51.0	+379	+25 14	92 33	214 33	$a^2$	$e^2$	13.9	-442	-23 23	159 52	309 42	
$d^3$ <sup>n</sup>	45.5	+425					f	23.9	+232	+18 23	167 30	317 20	e
$d^3$ <sup>s</sup>	45.5	+388	+27 27	99 36	221 36		$f^1$	47.5	+257	+19 47	171 7	320 57	$e^4$
$d^4$ <sup>n</sup>	44.8	+429					$f^2$	28.7	+204	+16 38	171 56	321 46	$e^5$
$d^4$ <sup>s</sup>	44.8	+402	+28 4	100 12	222 12	$a^3$	g	63.5	+288	+19 56	224 54	14 44	f
e	47.7	-290	-15 31	102 22	224 22		July 11 0 <sup>h</sup> 56 <sup>m</sup>						
$f_1$	16.1	-314	-15 41	134 24	256 24	d	a	-61.1	+272	+15 53	74 14	252 15	
$f_2$	14.8	-333	-16 53	135 31	257 31	$d^1$	$a^1$	58.6	+284	+17 4	79 14	257 15	
g	15.8	+225	+17 14	134 16	256 16	c	b	60.1	-274	-17 12	79 26	257 27	
$h^1$	+28.8	-418	-22 24	175 33	297 33	e	c	29.9	+239	+17 12	116 37	294 38	
h	31.5	-404	-21 32	178 5	300 5	$c^1$	$d^s$	24.6	-390	-21 46	123 29	301 30	a
$h^2$	37.3	-411	-22 12	184 31	306 31	$c^2$	$d^1$	23.5	-409				
$h^3$	39.2	-457	-25 26	187 56	309 56		$d^2$	21.6	-434	-23 57	125 36	303 37	$a^1$
$h^4$	41.2	-448	-24 55	190 9	312 9		e	20.9	-411	-22 21	126 26	304 27	
i	47.8	+253	+18 27	195 20	317 20	f	$e^1$	6.3	+239	+18 29	138 19	316 20	b
$i^1$	51.0	+200	+15 2	198 28	320 28	$f^1$	$e^2$	6.3	+178	+14 45	138 36	316 37	
July 8 0 <sup>h</sup> 41 <sup>m</sup>							$e^3$	5.5	+225	+17 38	139 6	317 7	
$a^s$	-59.4	+410					$e^4$	2.6	+164	+14 1	141 51	319 52	
$a^n$	57.9	+440	+26 42	72 5	207 51		$e^5$	0.7	+270	+20 39	143 10	321 11	
							$f^1$	+0.2	+206	+16 42	144 7	322 8	
								50.3	+230	+18 32	194 18	12 19	



Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1860 July 11—Continued						
$f_n$	+51.7	+258"	+19° 40'	197° 57'	15° 58'	$c$
$s$	53.3	+242				
$g$	56.3	-223	-9 19	201 58	19 59	$D$
July 15 1 <sup>h</sup> 0 <sup>m</sup>						
$a$	-62.2	-316	-22 15	67 3	301 14	
$a^1$	60.5	-342	-23 34	70 44	304 55	
$b$	53.4	+307	+17 52	82 58	317 9	
$c_n$	+1.4	+230	+19 6	142 16	16 27	$a$
$c_s$	4.6	+242				
$c^1$	13.8	+239	+16 42	149 29	23 40	
$c^2$	18.4	+230	+19 32	156 10	30 21	
$d$	12.8	-193	-6 22	152 26	26 37	
$d^1$	15.2	-183	-5 38	154 25	28 36	$B$
$d^2$	18.2	-197	-6 22	157 7	31 18	
$d^3$	22.4	-246	-9 12	161 11	35 22	
$e$	60.1	-367	-17 24	213 11	87 22	$d_1 d_2$
$f$	64.7	+197	+17 4	218 16	92 27	$f_1 f_2$
July 18 0 <sup>h</sup> 13 <sup>m</sup>						
$a^1$	-39.9	+322	+20 0	96 49	12 39	
$a^2$	37.6	+329	+20 46	99 13	15 3	$a^1$
$a$	36.7	+318	+20 19	101 16	17 6	$a$
	35.3					
$a^3$	35.3	+371	+23 41	100 34	16 24	$a^2$
$b$	31.4	-123	-5 36	111 8	26 58	$B?$
$b^1$	30.5	-216	-11 11	112 13	28 3	
$b^2$	23.2	-177	-7 57	118 56	34 46	
$c$	+12.0	-325	-14 4	150 14	66 4	
$c^1$	14.5	-322	-13 42	152 29	68 19	
$c^2$	17.6	-312	-12 52	155 7	70 57	
$d_1$	33.6	-396	-17 29	171 47	87 37	$c^1 c^2 c^3$
$d_2$	34.7	-378	-16 16	172 31	88 21	
$e$	34.5	+59	+10 32	168 24	84 14	
$e^1$	38.0	+47	+9 57	171 56	87 46	
$f_1$	43.2	+177	+17 59	178 8	93 58	$d^1$
$f_2$	43.6	+181	+18 14	178 41	94 31	$d^2$
$g^1$	55.3	-474	-23 5	206 51	122 41	$f^2$
$g^2$	57.4	-391	-17 23	205 21	121 11	$f^3 f^1?$
$g^3$	59.3	-419	-19 42	213 40	129 30	$f^5$
$g^4$	60.4	-382	-17 13	213 21	129 11	$f^4$
July 20 0 <sup>h</sup> 37 <sup>m</sup>						
$a^1$	-54.9	+366	+19 17	71 51	15 59	
$a$	53.8	+377	+20 12	73 15	17 23	
$a^2$	53.3	+421	+22 55	71 30	15 38	
$b$	33.6	-183	-9 48	107 24	51 32	$A?$
$b^1$	28.8	-188	-9 27	112 4	56 12	
Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$c^1$	+5.8	-368"	-16° 58'	143° 36'	87° 44'	
$c$	6.6	-373	-17 13	144 22	88 30	$c^1$
$c^2$	7.1	-363	-16 31	144 41	88 49	$c^2$
$d_1$	17.3	+183	+17 34	150 3	94 11	$d$
$d_2$	17.8	+188	+17 56	150 29	94 37	
$e$	28.9	-345	-13 50	163 47	107 55	$f$
$e^1$	30.9	-359	-14 35	166 41	110 49	$f^1$
$f^1$	39.4	-421	-18 16	177 17	121 25	
$f^2$	39.7	-497	-23 26	180 8	124 16	
$f$	40.4	-419	-18 6	178 23	122 31	$g$
$f^3$	45.3	-423	-18 16	184 39	128 47	$g^2$
$f^4$	48.1	-414	-17 40	188 14	132 22	$g^3$
$f^5$	48.3	-457	-20 36	190 28	134 36	$g^4$
$g$	63.8	+279	+24 8	218 19	162 27	$m$
$h$	66.2	+73	+11 36	215 37	159 45	$l$
July 22 1 <sup>h</sup> 5 <sup>m</sup>						
$a^1$	-49.7	-310	-21 5	86 32	59 1	$a$
$a$	44.5	-207	-13 24	93 57	66 26	
$a^2$	41.5	-203	-12 37	97 25	69 54	
$b$	31.2	+145	+9 54	105 5	77 34	$b$
$b^1$	27.9	+126	+9 15	108 29	80 58	
$c_1$	23.1	-317	-16 57	115 57	88 26	$c$
$c_2$	22.5	-315	-16 44	116 30	88 59	
$d$	11.8	+224	+17 17	121 47	94 16	$d_1$
$e$	8.9	-553	-31 7	130 10	102 39	$e^1$
$e^1$	4.1	-621	-35 39	135 37	108 6	$e^2$
$f$	1.9	-300	-13 11	134 43	107 12	$f$
$f^1$	+2.6	-339	-15 10	138 57	111 26	
$g$	12.3	-407	-18 33	148 19	120 48	$g$
$g^1$	19.3	-431	-19 32	155 7	127 36	$g^1$
$g^2$	22.1	-419	-18 29	157 31	130 0	$g^2$
$g^3$	25.3	-409	-17 37	160 30	132 59	$g^3$
$g^4$	26.7	-456	-20 38	162 52	135 21	$g^4 g^4$
$h$	16.6	+280	+23 53	147 3	119 32	
$h^1$	20.8	+285	+24 35	151 3	123 32	
$i$	41.8	-551	-26 31	184 3	156 32	
$k$	46.3	-408	-16 31	183 56	156 25	
$l_n$	54.3	+32	+10 32	187 49	160 18	$h$
$s$	54.3	+22				
$m^1$	52.6	+277	+25 50	188 45	161 14	$i^1$
$m^2$	54.0	+310	+27 55	192 19	164 48	$i^2$
$m$	54.7	+252	+24 16	191 37	164 6	$i$
$n$	55.0	-385	-15 5	196 51	169 20	$k$
$o$	61.9	-312	-10 53	209 29	181 58	$m$
July 24 1 <sup>h</sup> 3 <sup>m</sup>						
$a$	-62.0	-262	-22 13	60 46	61 17	
$a^1$	58.2	-294	-22 50	70 21	70 52	
$b$	53.0	+223	+10 4	76 42	77 13	

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date	Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1860 July 24—Continued													
<i>c</i>	-47.9	-246''	-17° 0'	87° 53'	88° 24'		<i>m</i>	+50.6	+ 59''	+14° 40'	177° 25'	235° 26'	<i>l</i>
<i>d</i> <sub>1</sub>	37.9	+288	+16 58	93 22	93 53		<i>m</i> <sup>1</sup>	52.5	+ 66	+15 10	180 4	238 5	<i>l</i> <sup>3</sup>
<i>d</i> <sub>2</sub>	37.2	+295	+17 31	93 57	94 28		<i>m</i> <sup>2</sup>	58.7	+ 49	+14 15	189 57	247 58	<i>l</i> <sup>5</sup>
<i>e</i>	35.5	-511	-32 43	100 8	100 39		<i>n</i>	62.4	- 19	+10 1	197 27	255 28	<i>m</i>
<i>e</i> <sup>1</sup>	33.6	-506	-31 56	102 35	103 6		July 30 1 <sup>h</sup> 11 <sup>m</sup>						
<i>e</i> <sup>2</sup>	28.3	-549	-34 7	108 18	108 49		<i>a</i>	-63.6	-189	-20 9	52 54	137 42	
<i>f</i>	32.0	-234	-13 13	105 38	106 9		<i>b</i>	62.1	+305	+ 9 22	45 52	130 40	
<i>g</i>	16.7	-366	-19 15	120 27	120 58	<i>a</i>	<i>c</i>	49.5	+601	+30 23	48 5	132 53	
<i>g</i> <sup>1</sup>	12.1	-384	-19 43	124 47	125 18	<i>a</i> <sup>1</sup>	<i>c</i> <sup>1</sup>	48.7	+611	+31 17	48 46	133 34	
<i>g</i> <sup>2</sup>	6.7	-384	-18 59	129 39	130 10		<i>d</i>	48.9	+257	+11 12	74 49	159 37	<i>b</i>
<i>g</i> <sup>3</sup>	3.3	-379	-18 13	132 37	133 8		<i>e</i>	47.0	-184	-14 18	83 50	168 38	<i>a</i>
<i>g</i> <sub>1</sub> <sup>4</sup>	0.7	-422	-20 42	135 18	135 49	<i>b</i> <sup>1</sup>	<i>f</i>	42.1	+356	+18 40	79 53	164 41	<i>c</i>
<i>g</i> <sub>2</sub> <sup>4</sup>	+ 0.1	-415	-20 7	135 57	136 28	<i>b</i>	<i>f</i> <sup>1</sup>	41.3	+439	+23 46	77 17	162 5	
<i>h</i>	31.4	+ 50	+11 32	159 40	160 11	<i>c</i>	<i>f</i> <sup>2</sup>	38.2	+460	+25 49	80 8	164 56	
<i>i</i> <sup>1</sup>	32.3	+300	+27 2	160 57	161 28	<i>e</i> <sup>1</sup>	<i>f</i> <sup>3</sup>	38.2	+425	+23 44	81 48	166 36	<i>c</i> <sup>1</sup>
<i>i</i>	35.7	+255	+24 26	164 24	164 55	<i>e</i>	<i>f</i> <sup>4</sup>	37.5	+325	+17 57	86 13	171 1	
<i>i</i> <sup>2</sup>	37.5	+321	+28 47	167 8	167 39	<i>e</i> <sup>2</sup>	<i>f</i> <sup>5</sup>	37.3	+367	+20 29	85 3	169 51	<i>c</i> <sup>2</sup>
<i>i</i> <sup>3</sup>	39.2	+298	+27 25	168 52	169 24		<i>g</i>	37.3	-264	-17 1	95 2	179 50	<i>d</i>
<i>k</i>	35.6	-391	-15 7	169 3	169 34	<i>d</i>	<i>h</i>	20.3	+ 61	+ 5 59	108 13	193 1	<i>e</i>
<i>l</i>	43.9	-419	-16 32	179 36	180 7	<i>f</i>	<i>h</i> <sup>1</sup>	18.4	+ 52	+ 5 48	110 1	194 49	<i>e</i> <sup>1</sup>
<i>l</i> <sup>1</sup>	46.2	-401	-15 16	181 59	182 30		<i>h</i> <sup>2</sup>	15.6	+ 42	+ 5 43	112 35	197 23	<i>e</i> <sup>2</sup>
<i>m</i>	48.8	-337	-11 34	183 41	184 12	<i>g</i>	<i>h</i> <sup>3</sup>	12.8	+ 52	+ 6 48	114 52	199 40	<i>e</i> <sup>3</sup>
<i>n</i>	60.5	- 64	+ 5 45	196 42	197 13	<i>k</i> <sup>2</sup>	<i>i</i> <sup>1</sup>	+ 5.3	+250	+21 39	128 11	212 59	
<i>o</i>	62.7	+283	+26 20	211 22	211 53	<i>k</i>	<i>i</i>	7.3	+316	+26 33	130 19	215 7	<i>g</i>
July 28 3 <sup>h</sup> 22 <sup>m</sup>							<i>i</i>	8.8	+316	+26 33	130 19	215 7	<i>g</i>
<i>a</i>	-60.6	-220	-20 7	63 2	121 3		<i>i</i> <sup>2</sup>	13.4	+316	+27 2	135 5	219 53	<i>g</i> <sup>1</sup>
<i>a</i> <sup>1</sup>	59.3	-224	-19 55	65 55	123 56		<i>i</i> <sup>3</sup>	13.4	+352	+29 20	134 51	219 39	<i>g</i> <sup>2</sup>
<i>b</i> <sup>1</sup>	53.1	-255	-20 0	76 44	134 45		<i>k</i>	- 0.5	-372	-16 47	130 12	215 0	<i>f</i>
<i>b</i>	51.7	-269	-20 31	78 48	136 49	<i>a</i>	<i>k</i> <sup>1</sup>	+ 2.4	-367	-16 1	132 40	217 28	
<i>c</i>	27.8	+168	+11 2	101 41	159 42	<i>d</i>	<i>k</i> <sup>2</sup>	4.0	-377	-16 23	134 13	219 1	<i>f</i> <sup>1</sup>
<i>d</i>	23.0	-276	-14 38	110 53	168 54	<i>e</i>	<i>k</i> <sup>3</sup>	7.7	-388	-16 32	137 38	222 26	
<i>e</i> <sup>1</sup>	19.9	+365	+24 21	105 9	163 10	<i>f</i> <sup>1</sup>	<i>l</i> <sup>1</sup>	20.5	+ 17	+ 9 48	143 55	228 43	
<i>e</i>	17.1	+349	+23 53	108 12	166 13	<i>f</i> <sup>2</sup>	<i>l</i> <sup>2</sup>	23.7	+ 14	+10 2	146 51	231 39	
<i>e</i> <sup>2</sup>	16.5	+380	+25 53	108 2	166 3	<i>g</i>	<i>l</i>	27.1	+ 90	+15 6	150 21	235 9	<i>h</i>
<i>f</i>	11.8	-354	-17 39	121 32	179 33	<i>h</i>	<i>l</i> <sup>3</sup>	28.8	+ 90	+15 6	150 21	235 9	<i>h</i>
<i>g</i>	4.7	-290	-12 37	127 9	185 10		<i>l</i> <sup>4</sup>	31.4	+ 88	+15 23	153 46	238 34	<i>h</i> <sup>1</sup>
<i>h</i>	+ 8.8	- 21	+ 5 41	135 50	193 51		<i>l</i> <sup>5</sup>	35.7	+ 40	+12 58	158 20	243 8	<i>h</i> <sup>2</sup>
<i>h</i> <sup>1</sup>	9.7	- 26	+ 5 30	136 40	194 41		<i>m</i>	40.6	+ 88	+16 22	163 27	248 15	<i>h</i> <sup>3</sup>
<i>h</i> <sup>2</sup>	11.6	- 24	+ 5 52	138 16	196 17			46.1	- 24	+10 4	170 6	254 54	<i>i</i>
<i>h</i> <sup>3</sup>	14.8	- 45	+ 5 2	141 14	199 15	<i>H</i>	July 31 3 <sup>h</sup> 10 <sup>m</sup>						
<i>h</i> <sup>4</sup>	17.2	- 47	+ 5 13	143 18	201 19		<i>a</i>	-56.9	-125	-13 45	68 42	168 42	<i>a</i>
<i>h</i> <sup>5</sup>	20.3	- 35	+ 6 18	145 58	203 59		<i>b</i>	56.5	+314	+11 48	59 25	159 25	<i>b</i>
<i>i</i> <sup>1</sup>	26.7	-416	-16 17	157 12	215 13	<i>k</i>	<i>c</i>	50.6	+430	+20 12	63 7	163 7	<i>d</i>
<i>i</i>	32.9	-428	-16 28	163 50	221 51	<i>k</i> <sup>3</sup>	<i>c</i> <sup>1</sup>	46.6	+476	+24 6	66 35	166 35	<i>d</i> <sup>3</sup>
<i>k</i>	31.9	+264	+25 46	156 3	214 4	<i>i</i>	<i>c</i> <sup>2</sup>	46.2	+423	+21 9	70 21	170 21	<i>d</i> <sup>2</sup>
<i>k</i> <sup>1</sup>	33.0	+330	+30 7	157 35	215 36		<i>c</i> <sup>3</sup>	44.2	+520	+27 24	67 12	167 12	
<i>k</i> <sup>2</sup>	36.7	+264	+26 15	161 18	219 19	<i>i</i> <sup>2</sup>	<i>d</i>	49.4	-202	-16 20	79 50	179 50	<i>c</i>
<i>l</i>	52.1	-345	- 9 28	183 12	241 13		<i>e</i>	35.4	+127	+ 6 39	92 3	192 3	<i>e</i>



1860 July 31—Continued

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$e^1$	-32.7	+103''	+ 5° 50'	95° 7'	195° 7'	
$e^2$	29.0	+ 89	+ 5 49	98 52	198 52	$e^1$
$e^3$	27.8	+113	+ 7 27	99 36	199 36	$e^2$
$f$	16.0	-329	-16 46	115 10	215 10	$f$
$f^1$	12.1	-329	-15 55	118 16	218 16	$f^1?$
$g^s$	6.6	+352	+26 45	115 3	215 3	$g$
$g^u$	5.2	+375	+26 45	115 3	215 3	$g$
$g^1$	0.7	+359	+27 26	120 0	220 0	$g^1$
$g^2$	0.4	+391	+29 33	119 49	219 49	$g^2$
$h^s$	+11.8	+134	+15 27	134 54	234 54	$h$
$h^u$	13.6	+120	+15 27	134 54	234 54	$h$
$h^1$	16.8	+127	+16 3	138 37	238 37	$h^1$
$h^2$	21.0	+ 73	+13 24	142 52	242 52	$h^2$
$h^3$	27.4	+ 85	+14 58	148 47	248 47	$h^4$
$i$	32.7	0	+10 32	154 31	254 31	$i$
$i^1$	35.3	+ 42	+13 20	156 51	256 51	$i^1$

August 1 1<sup>h</sup> 47<sup>m</sup>

$a$	-62.8	- 87	-13 56	55 31	168 44	
$b$	60.2	+345	+11 31	46 42	159 55	
$c$	57.3	-160	-16 23	66 56	180 9	
$d$	54.5	+476	+20 54	49 50	163 3	
$d^1$	52.4	+526	+24 25	49 18	162 31	
$d^2$	52.1	+513	+20 15	58 24	171 37	
$d^3$	51.3	+515	+24 19	53 29	166 42	
$d^4$	50.1	+528	+25 29	54 46	167 59	
$e$	46.1	+172	+ 6 31	78 35	191 48	$a$
$e^1$	40.9	+132	+ 5 31	85 20	198 33	
$e^2$	39.6	+158	+ 7 20	86 14	199 27	
$f$	29.3	-282	-16 31	101 36	214 49	
$f^1$	28.7	-267	-15 31	102 6	215 19	
$g^s$	18.1	+389	+26 39	102 8	215 21	$b$
$g^u$	16.8	+412	+26 39	102 8	215 21	$b$
$g^1$	12.3	+393	+27 18	107 17	220 30	$b^1$
$g^2$	11.1	+430	+29 54	107 31	220 44	$b^2$
$h^s$	1.7	+170	+15 28	121 36	234 49	$c$
$h^u$	0.2	+156	+15 28	121 36	234 49	$c$
$h^1$	+ 3.2	+158	+15 53	125 16	238 29	$c^1$
$h^2$	7.3	+103	+13 18	129 28	242 41	$c^2$
$h^3$	7.3	+179	+17 50	128 38	241 51	$c^4$
$h^4$	14.8	+109	+14 50	136 1	249 14	$e$
$i$	19.5	+ 26	+10 35	141 0	254 13	
$i^1$	22.2	+ 71	+13 39	143 4	256 17	
$k$	46.5	-610	-27 1	189 55	303 8	$g$
$l$	50.6	-572	-24 16	195 42	308 55	$H$
$m$	59.0	-284	- 4 34	192 47	306 0	

August 3 1<sup>h</sup> 33<sup>m</sup>

$a$	-60.5	+271	+ 6 46	49 26	190 35	
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Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$b^s$	-38.3	+474''	+26° 28'	74° 59'	216° 8'	$a$
$b^u$	37.0	+497	+26 28'	74° 59'	216° 8'	$a$
$b^1$	33.8	+474	+26 53	80 16	221 25	
$b^2$	31.8	+512	+29 44	80 35	221 44	
$c^s$	28.8	+239	+14 57	93 39	234 48	$b$
$c^u$	27.3	+259	+14 57	93 39	234 48	$b$
$c^1$	23.4	+245	+15 47	98 7	239 16	
$c^2$	21.4	+196	+13 21	100 58	242 7	$b^1$
$c^3$	18.7	+208	+14 38	103 14	244 23	
$c^4$	13.2	+185	+14 26	108 30	249 39	$b^2$
$d^1$	24.8	-189	-10 0	103 28	244 37	
$d$	12.7	-234	-10 10	114 41	255 50	$c$
$e$	10.8					$d$
$e$	9.3	+103	+10 16	112 35	253 44	
$e^1$	7.2	+ 91	+10 7	115 12	256 21	
$f$	+15.0	-246	+ 5 55	138 30	279 39	[ $e$ ]
$g^1$	27.8	-570	-24 52	158 34	299 43	
$g^2$	34.3	-514	-20 10	163 37	304 46	$f^1?$
$g$	35.2	-595	-25 46	168 31	309 40	$h$
$g^3$	41.7	-580	-24 7	176 42	317 51	$h^4$
$g^4$	43.0	-539	-21 5	176 6	317 15	
$g^5$	44.0	-547	-21 36	178 10	319 19	
$h$	40.4	-266	- 3 42	163 13	304 22	$g$
$h^1$	44.0	-301	- 5 33	168 13	309 22	
$i$	50.5	-566	-23 1	193 9	334 18	$i^1$
$k$	52.0	-474	-16 16	187 25	328 34	

August 5 1<sup>h</sup> 18<sup>m</sup>

$a$	-49.2	+545	+25 19	50 22	219 27	$c$
$b^s$	48.6	+346	+15 19	65 47	234 52	$a$
$b^u$	47.4	+366	+15 19	65 47	234 52	$a$
$b^1$	48.2	+295	+11 50	68 4	237 9	
$b^2$	45.3	+309	+13 31	71 15	240 20	
$b^3$	38.7	+286	+14 4	79 43	248 48	$a^1$
$c$	42.9	-160	-13 0	83 11	252 16	$b$
$d$	36.6	+211	+10 21	84 3	253 8	$d$
$d^1$	33.3	+231	+12 19	86 52	255 57	
$e$		-190	- 7 34	112 7	281 12	
$f$	+ 5.7	-452	-20 8	132 14	301 19	
$f^1$	12.1	-461	-19 32	138 13	307 18	$e^2$
$g$	12.3	-184	- 2 19	133 30	302 35	$g^?$
$h$	13.4	-545	-24 56	141 32	310 37	$f$
$h^1$	18.4	-517	-22 9	145 34	314 39	$f^1$
$h^2$	20.2	-533	-22 57	147 36	316 41	
$h^3$	21.7	-533	-22 41	149 19	318 24	$f^2?$
$h^4$	22.0	-578	-25 40	151 16	320 21	$f^3$
$h^5$	23.0	-501	-20 18	149 36	318 41	$f^3$
$h^6$	25.1	-560	-24 0	153 45	322 50	$f^3$
$i^1$	34.2	-560	-22 44	163 58	333 3	
$i$	35.7	-551	-21 56	165 22	334 27	$h$
$i^2$	39.4	-590	-24 19	172 29	341 34	$i$

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date	Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1860 August 5—Continued							$d_1$	-40 <sup>s</sup> .4	-295''	-21° 50'	81° 28'	335° 22'	
$i^3$	+40 <sup>s</sup> .2	-569''	-22° 43'	172° 18'	341° 23'		$d^1$	35.9	-335	-22 58	86 43	340 37	
$k$	52.6	+71	+18 19	173 19	342 24	$k$	$d^2$	32.0	-395	-25 44	91 13	345 7	
$l$	55.2	-102	+8 5	178 2	347 7	$l$	$e$	23.5	+129	+9 21	92 20	346 14	$a$
$l^1$	57.3	-116	+7 19	181 46	350 51	$l^1$	$f$	12.3	+267	+19 7	99 14	353 8	$b$
$m$	60.7	+106	+20 42	188 33	357 38	$m$	$f^1$	4.3	+276	+21 41	106 12	0 6	
August 6 1 <sup>h</sup> 22 <sup>m</sup>							$g$	+6.7	+101	+13 58	118 55	12 49	
$a^s$	-54.7	+393	+15 45	51 38	234 47		$g^1$	10.4	+99	+14 39	122 19	16 5	
$a^n$	53.5	+413					$h$	7.5	-557	-25 56	131 44	25 38	
$a^1$	48.0	+331	+13 37	65 49	248 58		$i^1$	11.2	+206	+21 11	121 23	15 17	
$b$	53.5	-110	-13 22	68 18	251 27		$i$	13.0	+179	+19 57	123 24	17 18	$c$
$b^1$	50.9	-124	-13 27	72 7	255 16		$i^2$	15.7	+195	+21 30	125 41	19 35	
$c$	50.8	+592	+26 18	36 33	219 42		$k$	31.9	+73	+17 39	143 18	37 12	$e$
$d$	46.9	+266	+10 21	69 43	252 52		$k^1$	33.1					
$e$	9.2	-383	-18 40	117 3	300 12	$a$	$k^2$	36.6	+38	+16 7	147 51	41 45	$c^2$
$e^1$	5.9	-379	-17 41	119 55	303 4		$l$	39.4	+106	+20 39	150 30	44 24	$e^5$
$e^2$	1.5	-427	-19 50	124 36	307 45		$l^1$	39.3	-595	-22 38	167 58	61 52	$f$
$f$	+0.6	-513	-25 9	128 3	311 12	$c$	$m^s$	41.7	-600	-22 45	172 3	65 57	
$f^1$	4.0	-486	-22 47	131 26	314 35		$m^n$	40.7	+17	+14 20	153 21	47 15	$e^4$
$f_1^s$	5.7	-496					$m^s$	41.7	-16				
$f_2^s$	8.2	-558	-26 45	136 14	319 23		$m^1$	43.2	+35	+16 59	155 24	49 18	
$f_2^2$	9.3	-506	-22 53	135 52	319 1	$C$	$m^2$	47.1	+42	+17 56	160 14	54 8	$e^8$
$f_3^2$	10.3	-482	-21 4	136 16	319 25		$m^3$	48.9	+31	+17 30	162 39	56 33	
$f_3^3$	12.6	-541	-24 38	139 55	323 4		August 15 0 <sup>h</sup> 41 <sup>m</sup>						
$g$	2.9	-196	-4 39	124 47	307 56		$a$	-58.0	+354	+7 51	36 36	345 39	
$h^s$	22.7	-538					$b$	48.9	+489	+19 6	45 17	354 20	$a$
$h^n$	23.6	-520	-21 56	149 49	332 58	$d$	$c$	35.5	+393	+18 59	68 44	17 47	$b$
$i^1$	28.6	-581	-24 40	157 40	340 49		$d$	27.3	-206	-11 39	90 52	39 55	
$i$	30.0	-586	-24 49	159 30	342 39	$d^1, d^2$	$d^1$	24.5	-239	-13 45	93 49	42 52	
$i^2$	30.9	-577	-24 4	160 4	343 13		$e$	21.3	+273	+16 51	87 27	36 30	$c^1$
$k$	44.8	+70	+17 50	161 53	345 2		$e^1$	20.0					
$l$	45.5	-96	+8 41	163 50	346 59	$e$	$e^1$	18.9	+273	+17 22	89 3	38 6	$c^2$
$l^1$	48.8	-117	+7 4	168 9	351 18		$e^2$	15.0	+248	+17 4	93 11	42 14	$c^3$
$m$	52.9	+110	+21 4	173 6	356 15	$f^1$	$e^3$	12.3	+229	+16 42	95 59	45 2	$c^4$
$n$	63.1	+86	+19 43	193 57	17 6	$i$	$e^4$	10.9	+205	+14 26	98 48	47 51	$c$
August 11 2 <sup>h</sup> 22 <sup>m</sup>							$e^4$	9.8	+171				
$a$	-63.0	-106	-18 58	43 36	297 30		$e^5$	9.8	+289	+20 55	96 49	45 52	$c^5$
$b$	59.0	-127	-18 11	53 51	307 45		$e^6$	8.0	+275	+18 1	96 17	45 20	
$c$	55.7	-246	-24 26	59 24	313 18		$e^7$	4.4	+269	+21 12	102 4	51 7	
$c^1$	54.0	-258	-24 29	62 25	316 19		$e^8$	3.4	+217	+18 25	104 3	53 6	
$c^2$	52.1	-232	-21 59	65 47	319 41		$f$	6.5	-460	-22 31	113 34	63 37	$d$
$c^3$	49.8	-256	-22 38	69 11	323 5		$g^1$	+43.6	-564	-18 42	168 16	118 19	$e^1$
$C$	52.1	-300	-25 55	67 39	321 33		$g$	49.9	-562	-18 18	182 4	131 7	$e$
$c^4$	49.8	-281	-23 48	70 59	324 53		$h$	59.8	+229	+31 42	182 27	131 30	$g$
$d$	42.2	-290	-21 59	79 43	333 37		$i$	60.2	-37	+15 37	178 47	127 50	$f$
	41.5						August 16 0 <sup>h</sup> 47 <sup>m</sup>						
							$a$	-52.2	+540	+19 24	30 10	353 19	
							$b$	43.7	+455	+19 10	54 41	17 50	$a$



Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date	Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1860 August 16—Continued							August 19 0 <sup>h</sup> 44 <sup>m</sup>						
$c^1$	-32.5	+341"	+16° 52'	72° 55'	36° 4'	$b^1$	$a^1$	-53.1	+493"	+15° 47'	31° 3'	36° 17'	
$c^2$	30.9	+334	+16 59	74 43	37 52		$a^2$	50.8	+464	+15 39	39 28	44 42	
$c^3$	27.3	+318	+17 14	78 47	41 56		$a^s$		+423				
$c^4$	25.9	+290	+16 7	81 2	44 11	$b^2$	$a_n$	50.0	+441	+14 26	43 24	48 38	$a$
$c_n$	23.4	+258					$b$	36.8	+741	+36 13	37 14	42 28	
$c_s$	22.5	+240	+14 40	84 54	48 3	$b$	$c^1$	+10.5	-471	-18 14	125 44	130 58	$e^1?$
$c^5$	21.7	+359	+21 22	82 52	46 1	$b^3$	$c^2$	12.1	-498	-19 33	127 57	133 11	$c^2$
$d$	19.4	-396	-22 6	99 56	63 5	$c$	$c$	13.3	-489	-18 40	128 47	134 1	$c$
$e^1$	+34.7	-548	-18 33	155 16	118 25	$d^1$	$d$	19.3	+58	+15 2	122 52	128 6	
$e$	44.4	-568	-18 35	170 2	133 11	$d$	$d^1$	20.3	+58	+15 26	123 47	129 1	
$f$	53.0	-35	+15 34	164 34	127 53	$e$	$e$	25.3	-497	-16 20	140 28	145 42	$e$
$g$	54.5	+235	+32 12	168 57	132 6	$f$	$e^1$	27.5	-502	-16 10	142 52	148 6	
August 17 0 <sup>h</sup> 50 <sup>m</sup>							$f$	28.0	+298	+31 49	128 39	133 53	$f$
$a$	-49.6	+505"	+18° 55'	40° 19'	17° 32'		$g$	41.2	+89	+21 53	145 3	150 17	$g$
$b^1$	42.2	+405	+16 46	58 16	35 29	$a^1$	$g^1$	46.7	+119	+24 42	152 5	157 19	$g^1$
$b_1^1$	42.2	+387	+15 47	59 9	36 22		$g^2$	49.3	+128	+25 42	155 51	161 5	$g^3$
$b^2$	37.3	+352	+15 38	66 19	43 32	$a^2$	$g^3$	49.5	+115	+24 57	156 7	161 21	$g^4$
$b_n$		+324					August 20 2 <sup>h</sup> 11 <sup>m</sup>						
$b_s$	34.3	+301	+14 28	70 58	48 11	$a$	$a$	-53.6	+493	+15 6	28 17	48 23	$b$
$b^3$	32.6	+423	+21 15	68 26	45 39	$a^3$	$b$	17.6	-406	-22 15	98 22	118 28	
$b^4$	28.9	+398	+21 6	73 19	50 32		$b^1$	17.0	-395	-21 20	98 44	118 50	
$c$	31.1	-331	-21 47	86 48	64 1		$c^1$	4.1	-436	-19 58	111 5	131 11	
$d^1$	+23.8	-516	-18 19	141 19	118 32	$b^2$	$c^2$	2.2	-439	-19 35	112 49	132 55	
$d$	36.1	-557	-18 38	156 34	133 47	$b$	$c^3$	1.3	-432	-18 53	113 27	133 33	
$e$	43.4	-14	+15 41	150 27	127 40		$c$	0.7	-429	-18 31	113 55	134 1	
$e^1$	44.4	-14	+15 51	151 43	128 56	$c$	$d$	+4.1	-459	-19 3	118 51	138 57	
$f$	47.1	+248	+32 19	155 19	132 32	$d$	$e_n$		-429				
$g$	62.1	+110	+25 2	183 45	160 55	$e^2?$	$e_s$	12.2	-439	-15 8	125 22	145 28	
August 18 1 <sup>h</sup> 4 <sup>m</sup>							$e^1$	13.4	-422	-14 15	126 4	146 10	
$a^1$	-48.8	+454	+16 24	44 54	36 17	$a^1$	$e^2$	15.4	-423	-13 49	127 53	147 59	
$a^2$	44.5	+416	+16 12	53 39	45 2	$a^2$	$f$	16.5	+351	+32 11	114 32	134 38	
$a_s$	43.9	+372					$g$	28.4	+131	+21 49	129 35	149 41	
$a_n$	43.3	+390	+14 40	56 36	47 59	$a$	$g^1$	33.1	+163	+24 50	134 14	154 20	
$a^3$	41.1	+482	+20 58	53 49	45 12		$g^2$	35.7	+156	+25 1	137 12	157 18	
$b^1$	+6.8	-413	-15 40	121 46	113 9		$g^3$	38.8	+164	+26 10	140 46	160 52	
$b^2$	13.1	-461	-17 6	128 34	119 57		$g^4$	39.1	+147	+25 12	141 13	161 19	
$b^3$	18.9	-464	-15 53	133 59	125 22		$h$	52.5	-388	+4 40	169 36	189 42	
$b$	25.6	+532	-18 45	142 49	134 12	$c$	$h^1$	53.8	-390	+4 43	172 16	192 22	
$b^4$	26.8	-516	-17 27	143 29	134 52		September 15 0 <sup>h</sup> 5 <sup>m</sup>						
$b^5$	36.0	-522	-15 54	153 45	145 8	$e$	$a$	-49.2	+594	+15 19	358 47	22 32	
$c$	32.8	+12	+15 24	137 30	128 53	$dd^1$	$b$	42.6	+490	+14 48	23 17	47 2	$a$
$c^1$	38.6	+26	+17 24	143 34	134 57		$c$	28.3	+507	+22 40	38 36	62 21	$b$
$d$	38.3	+266	+32 0	142 5	133 28	$f$	$c^1$	25.7	+492	+23 4	42 0	65 45	$b^1?$
$e$	51.5	+79	+22 47	160 3	151 26	$g$	$c^2$	22.6	+464	+23 1	46 25	70 10	$b^2$
$e^1$	54.5	+102	+24 34	165 5	156 28	$g^1$	$d$	+0.0	+109	+13 3	77 59	101 44	
$e^2$	57.0	+102	+24 48	169 50	161 13	$g^3$	$d^1$	2.8	+106	+13 56	80 23	104 8	

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1860 September 15—Continued						
e	+ 8.1	-461''	-15° 48'	99° 43'	123° 28'	dd <sup>1</sup>
e <sup>1</sup>	12.1	-484	-15 45	103 57	127 42	
f	23.7	-793	-32 42	134 23	158 8	e
f <sup>1</sup>	29.7	-780	-29 54	141 39	165 24	e <sup>1</sup>
g	45.9	-254	+ 7 49	130 49	154 34	} H
g <sup>1</sup>	47.2	-248	+ 8 28	132 22	156 7	
g <sup>2</sup>	48.7	-273	+ 7 21	135 8	158 53	
h	47.8	-118	+16 4	130 0	153 45	
h <sup>1</sup>	49.5	-130	+15 48	132 40	156 25	i <sup>1</sup> ? i <sup>2</sup> ?
h <sup>2</sup>	50.8	- 94	+18 10	133 50	157 35	i <sup>3</sup>
September 17 1 <sup>h</sup> 51 <sup>m</sup>						
a	-49.3	+600	+15 0	354 44	47 36	} a
b	40.7	+645	+22 49	10 15	63 7	
b <sup>1</sup>	39.8	+650	+23 34	11 14	64 6	
b <sup>2</sup>	37.8	+596	+22 10	19 39	72 31	a <sup>1</sup>
c	26.2	+ 71	+ 0 33	55 5	107 57	} b
d	19.6	-292	-16 44	69 43	122 35	
d <sup>1</sup>	20.2	-282	-16 24	68 57	121 49	
e	+ 6.5	-705	-32 16	106 51	159 43	c <sup>1</sup>
e <sup>1</sup>	14.0	-717	-30 7	114 51	167 43	c <sup>3</sup>
f	8.4	+111	+16 15	82 54	135 46	c <sub>1</sub> c <sub>2</sub>
f <sup>1</sup>		+ 99	+16 33	85 25	138 17	
g	12.4	-562	-20 19	105 18	158 10	
g <sup>1</sup>	14.0	-586	-21 16	107 47	160 39	c <sup>2</sup>
h	19.2	-158	+ 5 21	98 39	151 31	d
h <sup>1</sup>	25.6	-160	+ 7 17	104 27	157 19	d <sup>2</sup>
i	26.8	- 7	+15 59	102 11	155 3	e
i <sup>1</sup>	27.7	- 28	+15 22	103 25	156 17	e <sup>2</sup>
i <sup>2</sup>	30.1	- 56	+14 35	106 22	159 14	
i <sup>3</sup>	30.6	- 2	+17 46	105 44	158 36	
k	42.9	+123	+28 56	117 51	170 43	f
k <sup>1</sup>	46.5	+127	+30 16	122 52	175 44	f <sup>1</sup>
September 18 0 <sup>h</sup> 47 <sup>m</sup>						
a	-42.2	+691	+23 31	358 48	65 4	b
a <sup>1</sup>	41.4	+662	+23 0	5 54	72 10	
b	31.2	-197	-16 23	56 6	122 22	
c <sup>1</sup>	3.0	-648	-32 15	94 19	160 35	c <sup>1</sup>
c <sub>1</sub>	0.2	-474	-19 39	90 17	156 33	c
c <sub>2</sub>	+ 0.7	-476	-19 26	91 4	157 20	
c <sup>2</sup>	3.2	-524	-21 24	94 53	161 9	
c <sup>3</sup>	5.1	-655	-29 15	102 1	168 17	d
d	6.3	- 73	+ 5 28	84 43	150 59	d <sup>1</sup>
d <sup>1</sup>	12.4	-103	+ 6 1	90 31	156 47	d <sup>2</sup>
d <sup>2</sup>	13.4	- 92	+ 6 59	91 5	157 21	
e	15.2	+ 40	+14 49	89 29	155 45	
e <sup>1</sup>	18.1	+ 78	+17 58	91 11	157 27	d <sup>3</sup>

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
e <sup>2</sup>	+18.6	- 5''	+13° 33'	93° 33'	169° 49'	
f	33.0	+174	+28 44	104 6	170 22	f
f <sup>1</sup>	37.8	+173	+30 19	109 45	176 1	f <sup>1</sup>
g	44.0	-590	-12 29	142 6	208 22	g
September 20 0 <sup>h</sup> 40 <sup>m</sup>						
a	-57.1	-235	-33 16	18 53	113 10	a
a <sup>1</sup>	54.2	-274	-33 52	25 7	119 24	
b	50.6	- 26	-16 20	29 1	123 18	
c <sup>1</sup>	25.9	-286	-19 18	61 12	155 29	b
c	20.5	-359	-21 14	67 48	162 5	
d <sup>1</sup>	19.7	+115	+ 5 20	56 34	150 51	
d <sup>2</sup>	12.5	+ 82	+ 6 32	63 29	157 46	c
d	9.4	+228	+15 32	61 49	156 6	
d <sup>3</sup>	5.7	+221	+16 40	65 6	159 23	
e	3.2	-371	-14 39	82 55	177 12	d
e <sup>1</sup>	0.6	-378	-14 4	85 12	179 29	
f	+10.0	+304	+27 36	76 12	170 29	
f <sup>1</sup>	16.4	+318	+30 59	81 50	176 7	b <sup>1</sup>
g	26.8	-506	-11 46	113 40	207 57	c
g <sup>1</sup>	30.0	-531	-12 16	118 3	212 20	c <sup>1</sup>
h	35.6	-680	-20 14	134 32	228 49	d
h <sup>1</sup>	37.6	-709	-21 51	141 15	235 32	d <sup>1</sup>
i	43.8	-513	- 7 23	134 5	228 22	e
k	54.7	+ 63	+28 52	133 49	228 6	} F
k <sup>1</sup>	56.3	+ 68	+29 31	137 4	231 21	
September 22 0 <sup>h</sup> 20 <sup>m</sup>						
a	-30.5	+405	+15 31	34 39	156 47	b <sup>1</sup>
b	11.8	+476	+27 50	48 33	170 41	c
b <sup>1</sup>	6.1	+462	+29 37	54 15	176 23	d
c	+ 2.5	-348	-11 10	84 58	207 6	
c <sup>1</sup>	7.3	-392	-11 52	90 16	212 24	
d	18.2	-602	-20 29	107 50	229 58	f
d <sup>1</sup>	22.9	-642	-21 26	114 32	236 40	f <sup>1</sup>
e	24.6	-426	- 7 42	106 31	228 39	g
e <sup>1</sup>	27.3	-503	-11 19	112 7	234 15	g <sup>1</sup> ?
e <sup>2</sup>	29.8	-526	-11 14	115 58	238 6	
e <sup>3</sup>	31.7	-460	- 7 24	114 47	236 55	
f	37.3	+119	+27 6	105 44	227 52	} H
f <sup>1</sup>	38.0	+147	+29 0	106 10	228 18	
f <sup>2</sup>	40.5	+110	+27 38	109 40	231 48	
f <sup>3</sup>	41.2	+133	+29 15	110 20	232 28	
f <sup>4</sup>	42.1	+145	+30 16	112 22	233 30	
g	46.9	- 28	+21 36	120 2	242 10	
September 23 0 <sup>h</sup> 33 <sup>m</sup>						
a	-53.7	- 65	-20 38	22 5	158 23	a
b	39.3	+452	+13 36	20 0	158 18	b



## 1860 September 23—Continued

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$b^1$	-38.8	+477"	+15° 6'	21° 12'	157° 30'	
$c$	21.4	+550	+27 18	34 55	171 13	$c$
$d$	10.6	-255	-11 4	70 51	207 9	$d_1, d_2$
$e$	6.4	+61	+7 42	66 4	202 22	$e$
$e^1$	3.9	+49	+8 3	68 24	204 42	$e^1$
$f$	+7.1	-539	-20 44	94 8	230 26	$f$
$f^1$	12.4	-579	-21 10	100 28	236 46	
$g$	12.4	-351	-7 38	92 18	228 36	$g$
$g^1$	20.5	-416	-8 31	101 22	237 40	$g^1$
$h$	26.4	+203	+28 5	91 14	227 32	$h$
$h^1$	27.8	+199	+28 23	92 49	229 7	
$h^2$	30.4	+161	+27 8	96 17	232 35	$h^1$
$h^3$	32.0	+198	+29 53	97 22	233 40	$h^2$
$h^4$	32.5	+175	+28 42	98 16	234 34	
$i$	42.8	+14	+22 50	112 57	249 15	$k$

September 24 0<sup>h</sup> 52<sup>m</sup>

$a$	-58.1	+26	-18 18	11 20	161 51	
$b$	44.9	+530	+14 16	8 19	158 50	
$c$	29.3	+621	+26 58	21 8	171 39	$c$
$d_1$	23.5	-166	-11 35	56 47	207 18	$b^1$
$d_2$	22.9	-170	-11 33	57 24	207 55	$b^2$
$e$	20.4	+168	+7 34	50 33	201 4	$d$
$e^1$	16.8	+138	+7 29	54 25	204 56	$d^1$
$f$	4.7	-475	-21 33	80 58	231 29	$e$
$g$	0.8	-275	-8 20	78 21	228 52	$f$
$g^1$	+8.1	-354	-9 23	87 51	238 22	$f^1$
$h$	14.5	+266	+27 6	77 13	227 44	$i$
$h^1$	18.8	+196	+24 48	82 57	233 28	$i^1?$
$h^2$	21.8	+262	+29 46	84 18	234 49	$i^3$
$i$	17.7	-86	+8 51	88 40	239 11	$h^1$
$i^1$	20.9	-105	+8 56	91 56	242 27	$h^2$
$k$	28.5	+70	+22 16	94 38	245 9	$k$
$l$	38.6	-520	-8 48	123 27	273 58	$l$
$l^1$	39.5	-534	-9 24	125 23	275 54	$l^1$
$m$	51.5	-565	-9 37	154 29	305 0	$m$

September 25 2<sup>h</sup> 44<sup>m</sup>

$a$	-48.9	+121	-8 3	22 34	188 13	$a$
$b_1$	36.1	-48	-10 51	41 19	206 58	$b$
$b_2$	35.6	-53	-10 52	41 59	207 38	
$c$	34.9	+697	+27 33	5 46	171 25	
$d$	33.0	+285	+7 57	34 12	199 51	
$d^1$	29.1	+252	+8 0	39 4	204 43	
$e$	17.9	-378	-21 24	65 54	231 33	$c^1$
$e^1$	13.3	-412	-21 25	70 46	236 25	$c^2$
$f$	15.3	-155	-7 34	62 45	228 24	$d$
$f^1$	7.6	-269	-10 43	71 39	237 18	$d^1$

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$g$	-5.2	+189"	+14° 49'	61° 22'	227° 1'	$e^1$
$h$	+2.0	+29	+9 8	71 37	237 16	$f$
$h^1$	3.3	+11	+8 43	73 10	238 48	
$h^2$	6.5	+8	+9 42	75 51	241 30	$f^1$
$i$	2.0	+362	+27 18	62 1	227 40	$g$
$i^1$	5.4	+317	+26 12	66 28	232 7	$G$
$i^2$	7.4	+327	+27 36	67 55	233 34	
$i^3$	8.1	+348	+29 7	67 54	233 33	
$i^4$	9.9	+352	+30 5	69 22	235 1	
$k$	18.6	+177	+23 37	82 6	247 45	
$l$	27.7	-442	-7 29	107 3	272 42	$i^1$
$l^1$	29.0	-470	-8 41	109 25	275 4	$i$
$m$	46.9	-549	-8 32	137 0	302 39	$l$
$m^1$	48.4	-556	-8 46	140 54	306 33	$l^1$
$m^2$	49.9	-574	-9 56	147 38	313 17	$m$

September 26 0<sup>h</sup> 44<sup>m</sup>

$a$	-55.4	+200	-7 40	9 3	187 38	
$a^1$	54.5	+165	-8 55	11 59	190 34	
$b$	45.1	+21	-11 31	29 7	207 42	$a$
$c$	28.7	-311	-22 24	53 35	232 10	$b^1$
$c^1$	28.2	-281	-20 24	53 21	231 56	$b$
$c^2$	24.4	-318	-20 50	57 42	236 17	
$d$	27.1	-72	-8 9	49 26	228 1	$c$
$d^1$	19.9	-151	-9 20	57 37	236 12	
$d^2$	14.1	-211	-10 12	63 57	242 32	$d$
$e$	19.4	+281	+13 42	45 42	224 17	
$e^1$	16.0	+265	+14 19	49 8	227 43	
$f$	10.2	+114	+8 48	58 33	237 8	$e$
$f^1$	5.7	+86	+9 8	63 0	241 35	
$f^2$	4.6	+102	+10 26	63 26	242 1	
$g$	7.8	+427	+26 40	50 17	228 52	$f$
$g^1$	3.2	+388	+26 27	55 38	234 13	
$g^2$	1.5	+416	+28 46	56 4	234 39	
$h$	+1.4	+249	+20 47	64 7	242 42	
$h^1$	1.8	+231	+19 55	65 2	243 37	
$i^1$	15.9	-377	-7 49	93 12	271 47	
$i$	18.4	-407	-8 38	96 21	274 56	$g$
$k^1$	35.1	-775	-26 31	141 4	319 39	$i_1$
$k^2$	36.0	-766				
$k^3$	36.0	-766				
$k^4$	37.3	-747	-25 9	140 54	319 29	$i_2$
$l$	39.9	-522	-8 26	123 16	301 51	$h$
$l^1$	43.3	-534	-8 17	128 45	307 20	$h^1$
$m$	46.7	-585	-10 53	139 10	317 45	$k$
$n$	50.7	-72	+20 21	122 5	300 40	

September 28 0<sup>h</sup> 38<sup>m</sup>

$a$	-59.0	+181	-11 3	0 30	207 2	
$b$	49.4	-99	-20 36	24 28	231 0	

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date	Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1860 September 28—Continued													
$b^1$	-48.9	-134"	-22° 22'	25° 44'	232° 16'		$d$	+ 8.9	+ 35"	+11° 35'	66° 14'	24° 22'	$d$
$c$	48.0	+120	- 7 55	20 57	227 29	$a$	$d^1$	9.8	+ 30	+11 41	67 8	25 16	$d^1$
$d$	39.0	+ 6	- 9 31	34 17	240 49	$a^1$	$d^2$	12.8	- 7	+10 51	70 34	28 42	$d^2$
$d^1$	35.2	- 69	-11 47	39 56	246 28	$a^2$	$e$	29.9	- 49	+14 50	86 43	44 51	$f$
$e$	33.1	+312	+ 9 2	30 16	236 48		$f$	36.9	-177	+10 12	96 50	54 58	$g$
$f$	26.2	+581	+26 5	23 24	229 56	$b$	$f^1$	37.4	-194	+ 9 26	97 49	55 57	
$f^1$	25.3	+590	+27 0	23 42	230 14		$f^2$	41.1	-205	+10 0	102 10	60 18	$h?$
$f^2$	23.3	+577	+27 20	26 34	233 6		$g_1$	45.5	- 33	+21 1	103 35	61 43	$i_1$
$g$	9.5	-218	- 8 47	65 58	272 30		$g_2$	46.2	- 33	+21 13	104 25	62 33	$i_2$
$h$	+18.5	-407	- 8 38	94 26	300 58	$c$	$h_1$	48.5	-219	+11 28	111 51	69 59	$k$
$h^1$	24.1	-434	- 8 12	100 28	307 0	$c^2$	$h_2$	48.5	-245	+10 0	112 38	70 46	
$i_1$	24.1	-729	-26 35	116 12	322 44	$d_1$	$h^1$	49.6	-240	+10 35	113 59	72 7	
$i_2^{\text{n}}$	24.6	-708				$d_2$	$h^2$	52.0	-245	+10 55	117 52	76 0	$k^1$
$i_2^{\text{s}}$	25.7	-732	-25 35	116 40	323 12		$h^3$	53.8	-208	+13 28	119 30	77 38	$k^2$
$k^1$	31.9	-552	-12 32	113 21	319 53	$e^1$	$h^4$	54.4	-194	+14 25	120 18	78 26	$k^3$
$k$	32.6	-530	-11 0	112 59	319 31	$e$	October 7 0 <sup>h</sup> 58 <sup>m</sup>						
$l$	33.1	-743	-24 44	129 40	336 12	$g$	$a$	-61.2	+201	-11 54	345 35	318 37	
$m$	37.1	-764	-25 36	141 50	348 22	$h$	$b^{\text{n}}$	60.9	- 20				
September 30 1 <sup>h</sup> 24 <sup>m</sup>							$b^{\text{s}}$	- 67	-24 51		354 11	327 13	
$a$	-59.8	+259	- 7 58	351 58	227 1		$c^1$	50.7	-106	-22 5	14 24	347 26	
$a^1$	55.4	+171	- 9 26	6 29	241 32		$c$	47.5	-182	-25 25	19 44	352 46	$a$
$a^2$	53.3	+145	- 9 34	10 53	245 56		$d$	5.1	+156	+12 24	50 36	23 38	
$b$	37.5	+705	+26 24	356 30	231 33		$d^1$	1.8	+121	+11 54	54 15	27 17	
$c^1$	9.3	-211	- 8 25	63 59	299 2		$d^2$	+ 1.1	+112	+12 35	56 50	29 52	
$c$	8.0	-222	- 8 28	65 21	300 24		$e$	4.4	-522	-20 59	77 46	50 48	
$c^2$	3.8	-227	- 7 3	68 49	303 52		$f$	17.2	+ 58	+15 56	71 33	44 35	$b$
$d^1$	+ 2.0	-661	-30 48	88 24	323 27		$g$	24.2	- 78	+11 10	81 5	54 7	$c$
$d_1$	4.3	-603	-25 55	87 43	322 46	$a^1$	$h$	30.1	-107	+11 41	87 15	60 17	$d^1?$
$d^{\text{n}}$	5.1	-587				$a$	$i^1$	32.8	+ 65	+22 9	86 4	59 6	
$d^{\text{s}}$	6.5	-623	-25 25	89 8	324 11		$i_1$	34.9	+ 48	+21 56	88 36	61 38	$e$
$e$	10.2	-398	-11 12	85 5	320 8	$b$	$i_2$	35.6	+ 46	+22 5	89 24	62 26	
$e^1$	10.3	-419	-12 20	85 54	320 57		$k_1^{\text{n}}$	37.6	-147	+11 25	96 3	69 5	$f^1$
$f$	12.9	+108	+17 24	73 52	308 55		$k_1^{\text{s}}$	-170					
$f^1$	16.4	+ 84	+17 25	77 17	312 20		$k^1$	43.0	-184	+11 44	102 46	75 48	$f$
$g$	17.2	-668	-24 56	102 46	337 49		$k^2$	45.1	-151	+14 13	104 28	77 30	$f^1$
$g^1$	17.8	-656	-23 56	102 35	337 38		$k^3$	46.0	-121	+16 10	104 53	77 55	
$h$	25.7	-729	-25 58	116 5	351 8	$c$	October 10 23 <sup>h</sup> 13 <sup>m</sup>						
October 6 23 <sup>h</sup> 30 <sup>m</sup>							$a$	-63.7	- 13	-25 14	341 34	355 40	
$a^1^{\text{n}}$	-55.6	- 79					$b$	19.2	+289	+13 18	32 3	46 9	
$a^{\text{n}}$	54.9	- 77	-24 36	8 43	326 51	$b$	$c$	13.5	+183	+10 11	40 10	54 16	$b$
$a^2$	53.9	-161	-27 18	11 2	329 10		$d^1$	4.7	+152	+12 10	48 9	62 15	
$b$	55.8	+124	-12 22	2 3	320 11	$a$	$d_1$	2.6	+ 99	+10 13	51 20	65 26	$c$
$c$	37.3	-293	-26 9	35 0	353 8	$c$	$d_2$	1.6	+103	+10 51	52 3	66 9	
$c^1$	36.3	-309	-26 37	36 22	354 30		$d^2$	0.1	+ 76	+10 2	53 59	68 5	$c^1$
							$e$	+ 0.9	+280	+21 17	48 50	62 56	$d$
							$f^1$	3.4	+ 57	+10 23	57 15	71 21	
							$f$	8.5	+ 34	+11 8	61 58	76 4	$e^2?e^1?$



Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1860 October 10—Continued						
$j^2$	+ 9 <sup>s</sup> .9	+ 64''	+13° 16'	62° 20'	76° 26'	$e^2$
$g$	50.4	-196	+13 6	109 35	123 41	
$h$	56.3	-141	+17 45	117 55	132 1	$g^1$
October 12 0 <sup>h</sup> 7 <sup>m</sup>						
$a^1$	-38.2	-225	-22 44	26 55	69 37	} AB
$a$	37.5	-239	-23 11	27 59	70 41	
$a^2$	34.0	-281	-23 59	32 23	75 5	
$a^3$	32.4	-267	-22 23	33 41	76 23	
$b$	35.8	+367	+ 9 47	12 2	54 44	} c
$c^s$	28.9	+295	+ 9 32	21 54	64 36	
$c^n$	27.2	+309	+ 9 32	21 54	64 36	} d
$c^1$	26.4	+279	+ 9 32	24 15	66 57	
$d$	21.5	+464	+21 17	21 0	63 42	} e
$e$	18.0	+227	+10 28	33 11	75 53	
$e^1$	16.5	+230	+11 14	34 16	76 58	} h
$e^2$	15.4	+267	+13 38	33 57	76 39	
$f$	+37.1	-613	-14 53	109 0	151 42	} G
$g^1$	40.1	- 66	+16 59	91 19	134 1	
$g$	41.9	- 89	+16 18	93 52	136 34	
$h$	42.2	-665	-16 52	121 49	164 31	
$h^1$	42.8	-638	+14 55	119 52	162 34	} k
$h^2$	43.3	-642	-15 4	121 17	163 59	
$h^3$	45.7	-629	-13 44	124 53	167 35	$k^2$
October 15 1 <sup>h</sup> 10 <sup>m</sup>						
$a$	-63.1	+ 47	-21 1	339 19	64 44	} a
$a^1$	62.4	+ 49	-20 23	341 36	67 1	
$b$	60.0	- 26	-22 58	349 31	74 56	
$c$	52.0	+541	+ 9 43	333 51	59 16	
$d$	50.8	+520	+ 9 35	338 47	64 12	} b
$e$	41.7	+676	+21 49	339 20	64 45	
$e^1$	40.2	+671	+22 29	342 45	68 10	} c
$f$	1.1	-383	-15 34	60 35	146 0	
$g$	+ 2.0	+195	+16 47	47 19	132 44	} dd^1
$g^1$	7.0	+159	+16 49	52 21	137 46	
$g^2$	7.9	+162	+17 21	53 3	138 28	} e
$h^1$		-459	-18 7	66 45	152 10	
$h$	5.0	-406	-14 27	66 14	151 39	} f
$i$	11.9	-726	-31 34	86 33	171 58	
$k^s$	14.7	-482	-13 50	77 4	162 29	} h
$k^n$	16.5	-450				
$k^1$	15.7	-511	-16 25	78 54	164 19	} h^1
$k^2$	21.3	-495	-13 25	83 10	168 35	
$l$	19.6	- 14	+12 19	67 19	152 44	} h^2
$l^1$	21.4	- 12	+13 5	68 49	154 14	
$m$	34.1	-475	- 7 52	94 41	180 6	$i$

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
October 16 0 <sup>h</sup> 42 <sup>m</sup>						
$a$	-63 <sup>s</sup> .8	+ 24''	-22° 47'	336° 26'	75° 36'	
$b$	52.9	+554	+ 9 35	327 6	66 16	
$c$	43.2	+712	+22 16	327 20	66 30	
$d$	14.4	-283	-15 25	46 3	145 13	
$d^1$	12.9	-304	-15 59	47 47	146 57	
$e$	10.7	+286	+16 23	33 18	132 28	$b$
$e^1$	5.1	+216	+14 55	39 55	139 5	
$f^1$	10.1	-360	-18 0	51 39	150 49	$a^1$
$f^2$	7.8	-383	-18 21	54 11	153 21	
$f$	6.4	-390	-18 12	55 29	154 39	$a^2$
$g$	7.0	-323	-14 38	53 5	152 15	$a$
$h^n$	+ 3.0	-367	-14 19	62 58	162 8	$d$
$h^s$		-409				
$h^1$	4.1	-432	-16 24	65 17	164 27	$d^2$
$h^2$	9.9	-411	-13 23	69 37	168 47	$d^5$
$h^s$		-427				
$i$	23.5	-415	- 8 11	81 0	180 10	$e$
$k$	46.7	-654	-15 35	126 55	226 5	$g_1$
$k^1$	47.8	-644	-14 48	129 13	228 23	$g_2$
October 18 1 <sup>h</sup> 9 <sup>m</sup>						
$a^1$	-35.8	-158	-17 53	22 4	149 34	
$a$	32.0	-137	-14 57	25 17	152 47	$a$
$a^2$	30.7	-202	-18 3	27 55	155 25	$a^1$
$b$	32.3	+472	+16 37	4 53	132 23	$b$
$c$	31.2	+250	+ 5 46	15 13	142 43	
$c^1$	29.5	+276	+ 7 49	15 51	143 21	
$d^1$	25.6	-200	-15 42	32 25	159 55	
$d^n$	24.0	-181				
$d^s$	22.2	-220	-14 36	34 40	162 10	$c$
$d^2$	21.7	-234	-15 54	36 39	164 9	$c^1$
$d^3$	17.9	-239	-14 34	39 58	167 28	
$d^4$	15.8	-162	- 9 27	39 45	167 15	
$d^1_1$	15.8	-218	-12 32	41 10	168 40	$c^2_1$
$d^5_2$	15.8	-237	-13 34	41 39	169 9	$c^2_2$
$e$	2.6	-235	- 8 9	52 9	179 39	$d$
$f^1$	+11.8	-463	-15 24	70 40	198 10	
$f$	14.5	-485	-15 40	73 45	201 15	$e$
$g^1$	33.2	-541	- 8 13	82 6	209 36	
$g_1$	36.9	-624	-16 10	103 2	230 32	$g_1$
$g_2$	37.9	-604	-14 36	102 57	230 27	$g_2$
$h$	43.6	+165	+30 46	85 11	212 41	$h$
October 19 1 <sup>h</sup> 30 <sup>m</sup>						
$a$	-42.2	- 33	-14 23	10 40	152 25	
$a^1$	41.5	-108	-17 44	14 9	155 54	
$b$	40.3	+554	+16 58	350 6	131 51	

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date	Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1860 October 19—Continued							October 27 0 <sup>h</sup> 15 <sup>m</sup>						
$c^{\text{n}}$	-35.5	-85"	-14° 16'	20° 56'	162° 41'		$a$	-63.8	+131"	-15° 29'	325° 25'	218° 42'	
$c^{\text{s}}$	34.7	-119					$a^1$	59.7	+100	-14 43	337 4	230 21	
$c^1$	33.9	-135	-15 44	22 27	164 12		$a^2$	59.1	+63	-16 27	339 7	232 24	
$c_1^2$	28.4	-85	-10 36	26 15	168 0		$b$	17.5	-115	-8 7	28 13	281 30	
$c_2^2$	28.4	-131	-13 6	37 21	179 6		$c^1$	+17.5	-672	-27 8	75 48	329 5	$b^1$
$c^3$	19.3	-241	-15 20	37 50	179 35		$c^{\text{s}}$	18.1	-683				
$d$	16.3	-129	-7 56	37 30	179 15	$a$	$c^{\text{n}}$	19.6	-658	-26 39	77 5	330 22	$b$
$d^1$	13.8	-89	-4 46	38 32	180 17		$d$	39.5	-369	-1 51	83 21	336 38	$d$
$e$	+2.9	-410	-15 52	60 33	202 18		$d^1$	45.3	-406	-2 11	91 36	344 53	
$f$	6.8	-565	-23 32	69 21	211 6		October 30 0 <sup>h</sup> 52 <sup>m</sup>						
$f^1$	7.6	-573	-23 42	70 23	212 8		$a^1$	-59.6	-95	-25 20	337 57	273 42	
$g_1$	28.5	-569	-15 40	89 11	230 56	$B$	$a$	58.1	-117	-25 51	341 7	276 52	$a$
$g_2$	29.5	-549	-14 9	89 8	230 53		$a^2$	56.0	-124	-25 12	344 48	280 33	$a^1$
$g^1$	31.8	-524	-11 54	90 19	232 4		$b^1$	14.9	-460	-27 8	35 50	331 35	$b_1$
$h$	33.4	+234	+30 57	71 1	212 46		$b^{\text{n}}$	14.3	-452	-26 49	37 13	332 58	$b_2$
October 24 1 <sup>h</sup> 4 <sup>m</sup>							$b^{\text{s}}$	12.7	-477				
$a$	-61.7	+268	-7 41	326 38	178 18		$c$	12.1	+292	+15 22	18 37	314 22	$c_2$
$b$	32.2	-127	-14 39	18 51	230 31	$a$	$c^2$	5.3	+290	+17 52	24 9	319 54	$c^3$
$b^1$	31.5	-165	-16 28	20 21	232 1	$a^1$	$d$	+2.4	-134	-2 2	41 15	337 0	$d$
$b^2$	31.0	-158	-15 50	20 42	232 22		$e$	63.4	-211	+12 36	113 8	48 53	$f$
$c$	3.4	-132	-3 26	42 45	254 25	$b$	October 31 1 <sup>h</sup> 20 <sup>m</sup>						
$d$	+3.8	-562	-25 22	61 39	273 19	$c$	$a$	-63.6	-56	-25 9	327 6	277 9	
$e$	22.8	-405	-8 51	71 44	283 24	$d$	$a^1$	62.1	-68	-24 59	331 17	281 20	
$f^1$	36.9	-787	-28 12	117 36	329 16	$e^1$	$b^1$	31.9	-355	-27 58	16 35	326 38	
$f$	37.7	-776	-27 8	117 0	328 40	$e$	$b_1$	26.5	-363	-26 5	22 1	332 4	$a^1$
$g$	57.1	-435	-0 36	118 19	329 59	$g^1$	$b_2^{\text{n}}$	25.7	-363	-26 35	23 48	333 51	$a$
$h$	58.3	-156	+15 52	105 46	317 26	$f$	$b_2^{\text{s}}$	24.2	-400				
October 25 0 <sup>h</sup> 12 <sup>m</sup>							$b^2$	22.4	-420	-27 52	27 4	337 7	
$a$	-43.1	-42	-14 47	5 15	230 26	$a^1$	$b^3$	18.0	-374	-23 14	29 50	339 53	
$a^1$	42.3	-82	-16 40	6 55	232 6	$a^2$	$c_1$	25.4	+418	+16 55	1 56	311 59	
$a^2$	41.1	-35	-13 32	7 11	232 22		$c_2$	25.4	+400	+15 57	2 40	312 43	
$b$	18.1	-28	-3 41	27 35	252 46		$c^1$	24.3	+409	+16 52	3 17	313 20	
$b^1$	15.0	-29	-2 32	30 5	255 16		$c^2$	20.7	+344	+14 49	8 50	318 53	
$c$	8.8	-467	-24 39	46 36	271 47		$d^1$	17.4	+7	-1 45	21 18	331 21	$b$
$d$	+10.4	-322	-8 51	57 46	282 57	$b$	$d^2$	15.6	+26	-0 5	22 13	332 16	$b^1?$
$d^1$	13.0	-361	-10 4	61 3	286 14		$d$	11.6	-35	-1 52	26 53	336 56	$b^2$
$e^1$	32.6	-755	-27 4	101 59	327 10	$c^1$	$d^3$	4.0	-96	-2 22	34 18	344 21	
$e^{\text{s}}$	32.6	-759	-26 44	102 27	327 38	$c$	$e_1$	+44.0	-618	-15 48	98 37	48 40	
$e^{\text{n}}$	33.6	-746					$e_2$	45.3	-614	-15 13	100 29	50 32	$e^3$
$f$	51.1	-111	+16 14	91 48	316 59		$e^1$	44.6	-675	-19 22	106 33	56 36	$e$
$g^1$	52.4	-421	-0 50	105 8	330 19		$f$	58.6	-186	+12 55	98 48	48 51	$f$
$g$	54.7	-451	-2 5	111 58	337 9	$d$	$f^1$	58.6	-235	+10 8	100 30	50 33	$f^2$
$g^2$	56.7	-460	-2 22	118 45	343 56	$d^1$	$f^2$	61.0	-204	+12 25	104 34	54 37	$f^3$
							$f^3$	62.0	-232	+10 59	108 19	58 22	$f^4$



Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date	Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1860 November 4 1 <sup>h</sup> 20 <sup>m</sup>							November 7 0 <sup>h</sup> 43 <sup>m</sup>						
$a^1$	-62.1	-118"	-27° 17'	328° 0'	334° 11'	$a^1$	$i_1$	+51.6	-453"	-5° 9'	92° 43'	112° 57'	} $i$ $i^1$ $k$ $l$
$a$	61.2	-139	-28 4	330 12	336 23	$a$	$i_2$	51.9	-446	-4 40	92 49	113 3	
$b$	59.6	+276	-4 16	323 25	329 36	$b^1$	$i^1$	53.3	-491	-6 58	98 44	118 58	
$b^1$	56.6	+286	-2 23	328 39	334 50	$b^1$	$k$	59.8	-46	+19 58	91 53	112 7	
$b^2$	55.3	+242	-4 5	332 41	338 52	$b$	$k^1$	62.3	-81	+18 33	97 42	117 56	
$c$	51.4	-94	-20 34	346 53	353 4	$c$	November 7 0 <sup>h</sup> 43 <sup>m</sup>						
$c^1$	47.8	-122	-20 47	351 29	357 40	$c^1$	$a$	-67.2	+54	-19 30	306 7	354 3	
$d$	5.3	-70	-1 49	28 38	34 49		$a^1$	60.4	-77	-23 23	329 8	17 4	
$e^1$	+2.3	-430	-19 12	43 53	50 4		$b$	46.1	+638	+20 35	317 29	5 25	
$e^2$	4.6	-424	-18 3	45 35	51 46		$b^1$	45.7	+619	+19 48	320 30	8 26	$a$
$e^3$	6.8	-430	-16 55	47 41	53 52	$e^1$	$c^1$	32.2	-202	-18 57	6 11	54 7	$b^1$
$e^4$	7.8	-413				$e^2$	$c^2$	28.5	-224	-18 50	9 57	57 53	
$e^5$	10.3	-499	-20 25	52 42	58 53		$c$	27.7	-251	-20 6	11 12	59 8	$b^2$
$f^1$	15.3	-569	-22 53	59 46	65 57		$c^3$	25.3	-281	-20 56	13 57	61 53	$b^3$
$f^2$	19.7	-584	-22 15	64 26	70 37		$d^1$	27.7	+288	+9 16	358 15	46 11	$c^1$
$f^3$	12.3	-12	+7 16	40 58	47 9	$f^1$	$d^2$	23.7	+313	+12 3	0 55	48 51	$c^2$
$f^4$	16.5	+36	+11 17	43 16	49 27	$f^2$	$d^3$	23.7	+269	+9 42	2 17	50 13	
$f^5$	18.4	-29	+8 23	46 18	52 29	$f^3$	$d^4$	20.0	+214	+8 6	7 1	54 57	$c^3$
$g$	21.9	+5	+11 23	48 28	54 39	$g$	$d^5$	17.9	+283	+12 30	6 41	54 37	$c^4$
$g^1$	25.3	-48	+9 38	52 36	58 47	$g^1$	$e$	15.5	+231	+10 33	10 8	58 4	$c^5$
$h$	32.8	-15	+13 52	58 39	64 50	$h$	$f$	15.5	+502	+25 30	0 53	48 49	$e$
$h^1$	35.4	+183	+25 57	57 40	63 51	$h^1$	$f^1$	7.0	-400	-21 11	32 13	80 9	$f$
	38.7	+180	+26 53	61 16	67 27	$g^3$	$g$	3.1	+459	+27 43	13 12	61 8	$f^1 f^2?$
	64.8	-108	+17 42	106 41	112 52	$k$	$g^1$	+1.1	+420	+27 1	18 4	66 0	$g$
	65.8	-115	+17 24	111 15	117 26	$k^1$	$g^2$	4.4	+414	+27 42	21 10	69 6	$g^1$
November 5 1 <sup>h</sup> 21 <sup>m</sup>							$h$	0.3	+118	+9 53	25 33	73 29	
$a^1$	-65.9	-58	-25 38	315 23	335 37		$i$	33.0	-357	-5 30	64 28	112 24	$h$
$a$	65.4	-81	-26 44	317 17	337 31		$i^1$	36.9	-411	-7 20	70 12	118 8	$h^2$
$b^1$	62.5	+346	-2 13	307 38	327 52		$k$	40.7	+68	+20 22	61 58	109 54	$i$
$b$	60.7	+323	-2 18	316 14	336 28		$l$	47.0	0	+18 26	70 9	118 5	$i^2$
$c$	59.0	-9	-19 7	332 44	352 58	$a$	$l^1$	51.2	-25	+18 15	75 49	123 45	
$c^1$	57.1	-32	-19 33	336 20	356 34	$b$	November 8 0 <sup>h</sup> 57 <sup>m</sup>						
$d$	34.1	+538	+20 11	343 24	3 38	$b^1?$	$a$	-48.1	+658	+20 49	308 26	10 32	
$d^1$	30.8	+527	+20 50	347 22	7 36	$c^1$	$b^1$	43.2	-125	-18 46	352 42	54 48	
$e^1$	6.2	-341	-17 13	33 29	53 43	$c^2$	$b$	39.7	-137	-18 6	356 35	58 41	
$e_1$	2.2	-385	-18 20	37 50	58 4	$c$	$b^2$	39.7	-168	-19 52	357 5	59 11	
$e_2$	2.2	-418	-20 17	38 47	59 1	$d^1$	$b^3$	37.5	-191	-20 22	359 43	61 49	
$f^1$	1.6	+102	+8 34	26 22	46 36	$d^2?$	$c^1$	39.7	+365	+9 1	343 16	45 22	
$f^2$	+1.8	+116	+10 29	28 41	48 55	$d$	$c$	37.3	+348	+9 0	346 21	48 27	
$f^3$	2.7	+148	+12 32	28 37	48 51	$d^4$	$c^2$	35.4	+391	+11 59	346 32	48 38	
$f^4$	8.1	+116	+12 39	33 40	53 54	$d^5$	$c^3$	32.0	+297	+8 14	353 10	55 16	
$f^5$	11.6	+55	+10 31	37 53	58 7	$e?$	$c^4$	30.0	+363	+12 28	352 42	54 48	
$g^1$	19.9	+95	+15 29	43 51	64 5	$g$	$c^5$	28.2	+314	+10 30	356 1	58 7	
$g^2$	10.8	+309	+24 21	31 14	51 28	$g^2?$	$d$	34.3	+16	-7 36	358 44	60 50	
$g^3$	15.1	+348	+28 12	34 0	54 14	$j^2 f^1$	$d^1$	31.1	0	-7 19	1 58	64 4	
$h$	22.1	+307	+28 20	41 21	61 35		$e$	26.0	+547	+24 3	348 17	50 23	
	28.2	+277	+28 44	47 44	67 58		$f$	21.0	-313	-21 17	17 15	79 21	
	22.1	-584	-21 38	65 31	85 45								

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1860 November 8—Continued						
$f^1$	-16.5	-375''	-23° 14'	22° 40'	84° 46'	
$f^2$	14.9	-349	-21 10	23 15	85 21	
$g$	14.9	+527	+27 23	359 56	62 2	
	13.7					
$g^1$	9.3	+500	+27 44	5 26	67 32	
$h$	+20.7	-292	- 5 56	50 32	112 38	
$h^1$	24.3	-299	- 5 12	53 46	115 52	
$h^2$	26.2	-334	- 6 33	56 26	118 32	
$i$	27.9	+135	+19 49	47 6	109 12	
$i^1$	30.7	+114	+19 32	50 6	112 12	
$i^2$	36.1	+ 61	+18 15	56 14	118 20	
$k$	49.2	-599	-15 16	97 8	159 14	$c$
$l$	55.2	-505	- 8 12	100 55	163 1	$d$
November 16 0 <sup>h</sup> 33 <sup>m</sup>						
$a$	-46.6	+672	+24 18	304 43	118 52	
$a^1$	42.5	+668	+25 42	313 28	127 37	
$b$	41.1	+506	+17 10	328 10	142 19	
$b^1$	38.9	+504	+17 49	330 46	144 55	
$c_2$		-100				
$c_s$	39.1	-115	-15 53	347 59	162 8	
$d$	36.5	- 2	- 8 42	349 51	164 0	
	35.0					
$d^1$	35.0	- 14	- 9 8	350 45	164 54	
$d^2$	32.1	- 47	-10 0	354 4	168 13	
$e$	17.9	-196	-13 52	9 0	183 9	
$e^1$	16.2	-266	-17 20	11 46	185 55	
$e^2$	11.2	-302	-17 51	16 35	190 44	
$f^1$	2.3	-252	-12 14	22 38	196 47	
$f$	+ 4.3	-201	- 7 23	26 41	200 50	$a$
$f^2$	5.1	-300	-12 43	29 34	203 43	
$g$	19.7	+ 82	+12 41	33 6	207 15	$b$
$g^1$	24.5	+ 79	+13 56	37 14	211 23	
$g^2$	25.8	+ 77	+14 12	38 24	212 33	
$h$	57.0	+ 58	+21 58	73 9	247 18	$c$
November 22 0 <sup>h</sup> 10 <sup>m</sup>						
$a$	-64.9	+148	- 8 45	302 42	200 49	
$b_s$	56.0	+440	+10 43	306 45	204 52	
$b_n$	54.4	+458				
$b^1$	52.0	+417	+ 9 59	314 0	212 7	
$b^2$	49.9	+453	+12 36	314 56	213 3	
$c$	16.1	+431	+21 25	350 14	248 21	$b$
$c^1$	13.6	+472	+24 34	351 3	249 10	
$d$	+ 0.9	-302	-15 2	19 46	277 53	$c$
$d^1$	2.6	-318	-15 29	21 29	279 36	$c^1$
$e$	12.8	-437	-19 37	32 52	290 59	$e$
$f$	45.7	-678	-25 35	83 6	341 13	$g$
November 28 22 <sup>h</sup> 55 <sup>m</sup>						
$a$	-59.1	-104	-19 46	311 43	293 19	
$b$	24.6	- 81	- 8 37	348 29	330 5	
$b^1$	17.0	-146	-11 24	356 2	337 38	
$c$	14.4	-379	-24 30	1 49	343 25	
$d$	5.9	+387	+21 31	354 59	336 35	
$e$	3.3	-346	-19 37	10 38	352 14	
$f_1$	+ 0.0	+172	+10 32	4 7	345 43	
$f_2$	0.7	+174	+10 49	4 38	346 14	
$f_1^1$	7.8	+165	+12 1	10 24	352 0	
November 24 23 <sup>h</sup> 49 <sup>m</sup>						
$a$	-58.7	+370	+ 5 55	303 46	229 45	$a$
$a^1$	56.1	+367	+ 6 29	308 35	234 34	$a^1$
$b$	38.3	+533	+21 2	323 14	249 13	$b$
$c$	30.8	-172	-16 28	348 50	274 49	$c$
$c^1$	25.8	-195	-17 21	353 34	279 33	$c^1$
$d$	20.5	+578	+29 2	339 0	264 59	$d$
$d^1$	18.7	+553	+28 1	341 48	267 47	$d^1$
$e$	12.9	-315	-19 53	6 34	292 33	$e$
$f$	+32.2	-336	- 9 12	44 36	330 35	$f$
$g$	33.5	-620	-25 45	57 41	343 40	$g$
$h$	35.6	-531	-18 58	54 51	340 50	$h$
$i$	39.4	-388	-10 23	53 13	339 12	
$k$	43.1	-558	-19 26	65 19	351 18	$i$
$l$	48.7	+136	+21 36	52 38	338 37	$k$
$l^1$	51.3	+135	+22 13	55 55	341 54	$k^1$
November 25 0 <sup>h</sup> 37 <sup>m</sup>						
$a$	-62.8	+403	+ 6 40	288 0	228 29	
$a^1$	61.5	+394	+ 6 38	294 31	235 0	
$b$	46.5	+575	+21 18	309 12	249 41	
$c$	44.1	-114	-16 45	334 0	274 29	
$c^1$	40.3	-141	-17 15	338 18	278 47	
$d$	31.6	+630	+29 2	324 6	264 35	
$d^1$	29.4	+608	+28 20	327 50	268 19	
$e$	26.5	-246	-19 36	352 36	293 5	$a$
$f$	+18.7	-271	- 9 12	30 6	330 35	$b$
$g$	23.6	-566	-25 22	43 31	344 0	$c$
$h$	24.5	-465	-18 58	40 26	340 55	
$i$	33.6	-510	-19 18	50 54	351 23	$e$
$k$	35.7	+188	+21 0	37 9	337 38	$d$
$k^1$	40.0	+183	+21 49	41 35	342 4	
$l$	59.9	-317	- 1 59	76 15	16 44	
$l^1$	62.4	-301	- 0 32	80 53	21 22	$i$



## 1860 November 28—Continued

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$f_2^1$	+ 9.7	+169"	+12° 42'	11° 53'	353° 29'	
g	14.3	+308	+21 58	13 28	355 4	
$g^1$	18.3	+330	+24 18	16 37	358 13	
h	19.5	-319	-12 29	28 40	10 16	
$h^1$	22.9	-348	-13 20	32 16	13 52	
$h^2$	24.6	-390	-15 18	34 54	16 30	
$h^3$	25.5	-347	-12 39	34 32	16 8	
i	35.4	-163	+ 0 3	39 3	20 39	
$k_s^n$	53.7	-100	+ 8 42	57 56	39 32	
	55.1	- 72				

December 14 0<sup>h</sup> 56<sup>m</sup>

a	-65.1	+329	+ 9 28	274 54	122 13	
b	56.5	+554	+24 19	276 16	123 35	
c	54.9	-161	-18 0	301 2	148 21	a
$c^1$	53.1	-129	-15 51	303 30	150 49	$a^1$
$c^2$	49.1	-166	-17 27	308 11	155 30	
$c^3$	48.2	-235	-21 35	308 58	156 17	$a^2$
$c^4$	46.2	-240	-21 38	311 16	158 35	$a^3$
d	5.6	-231	-15 19	348 45	196 4	
e	2.3	-356	-22 21	352 51	200 10	$b^1$
$e^1$	+ 0.8	-388	-23 52	355 55	203 14	$b^2$
f	0.8	+515	+30 1	345 29	192 48	c
g	5.5	+182	+10 8	353 22	200 41	d
h	28.5	+ 64	+ 6 38	13 22	220 41	e

December 15 0<sup>h</sup> 33<sup>m</sup>

a	-62.8	-146	-17 44	287 52	149 0	
$a^1$	62.0	-116	-15 51	289 38	150 46	
$a^2$	57.9	-218	-21 33	295 0	156 8	
$a^3$	56.1	-220	-21 28	297 40	158 48	
b	21.7	-171	-14 4	333 49	194 57	
$b^1$	17.2	-323	-21 37	338 38	199 46	
$b^2$	12.9	-348	-23 33	342 30	203 38	
c	11.9	+551	+30 24	332 28	193 36	
d	9.9	+225	+10 24	339 39	200 47	
e	+13.0	+109	+ 6 46	359 10	220 18	

December 23 0<sup>h</sup> 22<sup>m</sup>

$a^1$	-54.7	+499	+24 13	278 26	251 35	
$a^2$	54.2	+479	+22 54	280 53	254 2	
a	52.2	+472	+22 30	284 33	257 42	
$a^3$	50.7	+501	+24 24	285 21	258 30	
b	48.9	- 28	- 7 19	298 42	271 51	
$b^1$	45.2	-169	-15 26	302 27	275 36	
$b^2$	44.0	-166	-15 11	303 48	276 57	
$b^3$	40.0	-189	-16 8	307 44	280 53	

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
c	-15.0	+318"	+15° 10'	327° 20'	300° 29'	
$c^1$	9.2	+317	+15 38	332 10	305 19	
$c^2$	6.9	+295	+14 29	334 16	307 25	
$c^3$	2.8	+305	+15 26	337 37	310 46	
d	+11.9	-210	-13 29	352 55	326 4	
$d^1$	13.8	-206	-13 4	354 25	327 34	
$e^1$	19.2	+229	+12 49	356 13	329 22	
$e^2$	27.2	+257	+15 17	3 10	336 19	
e	31.9	+257	+15 46	7 27	340 36	
$e^3$	34.7	+264	+16 29	10 7	343 16	
f	42.3	-414	-22 37	24 59	358 8	
$g_1^1$	68.6	+ 47	+ 7 49	55 32	28 41	
$g_2^1$	69.1	+ 30	+ 6 56	57 14	30 23	$a^2$
g	70.0	+ 54	+ 8 31	60 57	34 6	$a^2$

1861 January 2 23<sup>h</sup> 35<sup>m</sup>

$a^1$	-63.5	+157	+ 6 44	267 20	20 30	
a	59.0	+164	+ 6 49	274 53	28 3	$a^1$
$a^2$	55.1	+199	+ 8 42	279 46	32 56	a
b	62.0	-318	-21 13	263 31	16 41	
$c^1$	44.8	-124	-10 35	292 7	45 17	
c	41.2	-132	-11 8	295 45	48 55	b
$d^1$	20.1	-274	-19 46	314 38	67 48	
$d^2$	17.3	-311	-22 1	316 57	70 7	
d	15.9	-281	-20 11	318 20	71 30	
e	10.1	+162	+ 5 57	323 20	76 30	c
$e^1$	8.5	+150	+ 5 12	324 39	77 49	
f	+42.7	+412	+22 51	11 37	124 47	
g	49.2	+299	+16 5	17 14	130 24	$d^2$
$g^1$	51.0	+335	+18 28	20 12	133 22	
$h^1$	58.1	-258	-16 7	30 30	143 40	$e^2$
h	59.0	-272	-16 51	32 26	145 36	e
i	64.1	+313	+18 25	42 24	155 34	f
$i^1$	64.8	+333	+20 0	46 17	159 27	

January 4 0<sup>h</sup> 10<sup>m</sup>

$a^1$	-69.7	+133	+ 7 15	247 4	29 39	
a	68.4	+165	+ 8 50	252 1	33 36	
$b^1$	65.2	-173	-12 27	260 0	41 35	
b	61.0	-173	-12 0	268 13	49 48	a
c	40.3	+150	+ 5 42	294 53	76 28	b
d	+20.0	+327	+12 51	349 35	131 10	
$d^1$	21.1	+328	+13 47	349 43	131 18	C
$d^2$	24.5	+334	+16 25	350 39	132 14	
$e^1$	34.5	-230	-16 39	0 4	141 39	$d^1$
$e^2$	37.9	-213	-15 32	3 16	144 51	$d^3$
e	39.3	-229	-16 26	4 51	146 26	d
$e^3$	39.3	-302	-20 48	5 54	147 29	
f	46.2	+345	+17 55	12 39	154 14	
g	58.4	-206	-14 0	27 38	169 13	e
$g^1$	59.8	-185	-12 39	29 21	170 56	

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1861 January 5 <sup>0</sup> <sup>h</sup> 23 <sup>m</sup>						
a	-66.5	-194''	- 9° 54'	256° 6'	51° 50'	
b	52.5	+133	+ 5 32	280 41	76 25	
c	+ 3.2	+317	+14 58	331 21	127 5	
c <sup>1</sup>	5.0	+313	+14 43	332 52	128 36	
c <sup>2</sup>	9.4	+331	+15 49	336 38	132 22	
c <sup>3</sup>	9.4	+384	+19 7	336 49	132 33	
d <sup>1</sup>	19.6	-218	-16 33	345 13	140 57	a
d <sup>2</sup>	21.8	-211	-16 6	347 7	142 51	
d <sup>3</sup>	24.0	-203	-15 36	349 2	144 46	
d <sup>4</sup>	25.0	-249	-18 20	350 14	145 58	
d	25.6	-209	-15 56	350 29	146 13	b
d <sup>5</sup>	30.1	-249	-18 14	355 6	150 50	
e	48.0	-192	-14 17	12 42	168 26	c
f	66.1	+226	+11 49	41 5	296 49	d?
January 12 <sup>0</sup> <sup>h</sup> 35 <sup>m</sup>						
a	-63.8	-338	-17 37	245 22	139 28	
b	60.7	-321	-17 25	254 16	148 22	
c	46.4	-233	-14 24	277 40	171 46	
d	24.8	+179	+ 7 34	301 37	195 43	
e	+33.0	- 92	-11 8	349 20	243 26	
e <sup>1</sup>	35.4	- 85	-10 47	351 39	245 45	
f	49.8	+300	+11 55	9 9	263 15	
g	61.3	+307	+12 54	26 58	281 4	a
January 22 1 <sup>h</sup> 5 <sup>m</sup>						
a	-64.3	+106	+11 55	244 41	279 25	a
b	36.1	-145	- 8 37	278 39	313 23	a <sup>1</sup>
b <sup>1</sup>	32.1	-103	- 6 53	283 1	317 45	
c <sup>1</sup>	26.5	-405	-25 24	282 25	317 9	
c	23.8	-401	-25 36	285 9	319 53	
d	19.7	+ 33	- 0 59	295 25	330 9	b
d <sup>1</sup>	16.2	+ 23	- 2 3	298 13	332 57	b <sup>1</sup>
e	11.0	+565	+30 50	306 31	341 15	
f <sup>1</sup>	+29.5	+234	+ 5 8	338 19	13 3	
f <sup>2</sup>	34.8	+292	+ 8 10	344 11	18 55	c <sup>1</sup>
f <sup>3</sup>	37.4	+222	+ 3 49	345 39	20 23	c <sup>2</sup>
f <sup>n</sup> <sub>s</sub>	37.9	+288	+ 6 31	346 50	21 34	c
f <sup>4</sup>	39.1	+248	+ 5 14	347 42	22 26	
f <sup>5</sup>	45.0	+304	+ 8 16	354 58	29 42	c <sup>3</sup>
g	49.1	- 2	- 9 57	356 18	31 2	d
g <sup>1</sup>	50.7	- 52	-12 56	358 12	32 56	d <sup>2</sup>
g <sup>2</sup>	55.8	- 19	-11 20	4 51	39 35	d <sup>3</sup>
January 23 <sup>0</sup> <sup>h</sup> 31 <sup>m</sup>						
a	-47.8	-182	- 8 16	264 46	313 12	a
a <sup>1</sup>	44.5	-150	- 7 10	269 1	317 27	a <sup>1</sup>
1861 January 5 <sup>0</sup> <sup>h</sup> 23 <sup>m</sup>						
b	-33.9	- 5''	+ 0° 2'	281° 31'	329° 57'	b
b <sup>1</sup>	30.5	- 9	- 1 38	284 33	332 59	
c <sup>1</sup>	+21.0	+260	+ 7 13	330 16	18 42	
c <sup>2</sup>	22.7	+184	+ 2 33	330 52	19 18	c <sup>2</sup>
c	25.1	+256	+ 6 33	333 49	22 15	c
c <sup>3</sup>	32.7	+283	+ 7 29	341 9	29 35	
d	37.7	- 14	-10 17	343 4	31 30	d <sup>3</sup>
d <sup>1</sup>	37.4	- 61	-13 0	342 38	31 4	
d <sup>2</sup>	39.3	- 61	-13 6	344 34	33 0	d
d <sup>3</sup>	45.2	- 23	-11 19	350 53	39 19	
January 25 <sup>0</sup> <sup>h</sup> 34 <sup>m</sup>						
a	-62.6	-288	- 9 34	235 39	312 11	
a <sup>1</sup>	61.3	-242	- 7 35	241 0	317 32	
b	56.3	- 99	- 1 5	253 25	329 57	a
c <sup>1</sup>	16.2	+141	+ 4 51	296 21	12 53	
c <sup>2</sup>	9.7	+134	+ 3 26	301 40	18 12	
c <sup>3</sup>	8.6	+246	+ 9 50	303 39	20 11	
c <sup>4</sup>	6.6	+162	+ 4 35	304 31	21 3	b <sup>4</sup>
c	6.6	+216	+ 7 45	304 59	21 31	b
d <sup>1</sup>	5.3	- 87	- 9 56	303 0	19 32	c
d <sup>2</sup>	+ 1.3	-113	-12 23	308 11	24 43	c <sup>1</sup> ?
d <sup>3</sup>	7.6	- 66	-10 31	313 50	30 22	c <sup>2</sup>
d	10.3	-106	-13 12	315 48	32 20	c <sup>3</sup>
e <sup>1</sup>	37.8	+473	+18 11	348 54	65 26	d <sup>1</sup>
e <sup>2</sup>	38.6	+388	+12 45	347 22	63 54	d <sup>2</sup>
e	40.7	+471	+17 51	352 7	68 39	d
f <sup>1</sup>	48.8	+381	+11 42	359 6	75 38	d <sup>3</sup>
f	51.8	+392	+12 18	3 39	80 11	d <sup>4</sup>
g	63.6	+ 54	- 8 2	15 41	92 13	e
January 27 <sup>0</sup> <sup>h</sup> 43 <sup>m</sup>						
a	-66.7	-176	- 0 51	225 42	330 23	
b <sup>1</sup>	39.8	+ 75	+ 5 35	272 28	17 9	
b <sup>2</sup>	38.0	+187	+11 46	275 5	19 46	
b <sup>3</sup>	37.5	+ 26	+ 2 17	274 14	18 55	
b <sup>4</sup>	37.3	+ 70	+ 4 47	274 54	19 35	
b	35.9	+128	+ 7 49	276 48	21 29	
c	35.3	-169	- 9 14	273 25	18 6	
c <sup>1</sup>	28.1	-173	-10 54	280 4	24 45	
c <sup>2</sup>	23.0	-150	-10 33	285 1	29 42	a
c <sup>3</sup>	19.6	-182	-13 1	287 28	32 9	a <sup>1</sup>
c <sup>4</sup>	13.3	-124	-10 49	293 43	38 24	
d <sup>1</sup>	+ 9.5	+433	+18 21	319 24	64 5	b
d <sup>2</sup>	10.1	+345	+12 49	318 34	63 15	
d	14.2	+426	+17 13	323 23	68 4	b <sup>1</sup>
d <sup>3</sup>	23.6	+360	+11 57	330 33	75 14	c
d <sup>4</sup>	29.5	+359	+11 13	336 2	80 43	
e	44.3	+ 55	- 8 6	346 33	91 14	
e <sup>1</sup>	46.8	+ 85	- 6 34	349 36	94 17	



Letter	$\Delta\alpha$	$\Delta\delta$	$\delta$	L	L'	Letter on next date	Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1861 February 1 $0^h 39^m$							i	-58.0	+281''	-1° 28'	355° 40'	324° 46'	j
a	-62.2	-376''	-10° 52'	218° 21'	33° 10'		k	64.4	-9	-18 36	5 18	334 24	g
a <sup>1</sup>	60.8	-399	-12 49	221 29	36 18		k <sup>1</sup>	65.6	-16	-18 48	9 58	339 4	g <sup>1</sup>
b	54.4	+202	+18 11	250 53	65 42		k <sup>2</sup>	65.6	-47	-20 36	10 24	339 30	
b <sup>1</sup>	53.2	+206	+18 4	252 32	67 21		February 14 $1^h 11^m$						
c	47.8	+127	+11 40	259 18	74 7		a	-36.5	+158	+12 32	259 2	256 36	a <sub>2</sub>
d	27.8	-56	-3 44	276 58	91 47		b	5.4	+338	+13 47	289 30	287 4	a <sub>3</sub>
e	+5.5	+571	+27 18	314 34	129 23		b <sub>1</sub>	4.2	+345	+13 52	290 38	288 12	a <sup>2</sup>
f	8.5	+447	+18 35	314 38	129 27		b <sup>1</sup>	+1.9	+414	+16 25	297 10	294 44	b <sub>1</sub> b <sub>2</sub>
g	11.4	+218	+4 17	313 22	128 11		c	20.5	+84	-7 9	306 33	304 7	B
g <sup>1</sup>	13.2	+228	+4 34	315 1	129 50		c <sup>1</sup>	26.6	+110	-7 2	312 26	310 0	
h	55.3	+461	+13 58	8 6	182 55		c <sup>2</sup>	27.7	+122	-6 34	313 39	311 13	
February 6 $23^h 34^m$							d	27.9	+380	+8 16	319 12	316 46	c
a	-52.3	-456	-17 36	230 56	115 18		d <sup>1</sup>	32.0	+421	+9 54	324 20	321 54	c <sup>1</sup>
a <sup>1</sup>	50.1	-430	-17 5	236 14	120 37		e	35.9	-191	-26 21	318 12	315 46	e
a <sup>2</sup>	48.3	-440	-18 16	238 20	122 42		e <sup>1</sup>	38.8	-189	-26 50	321 30	319 4	e <sup>3</sup>
b	52.3	+23	+8 18	247 43	132 5		f	39.1	+246	-1 44	327 9	324 43	f
b <sup>1</sup>	47.9	+82	+10 16	253 48	138 10		g	51.7	-9	-18 28	338 34	336 8	g <sup>3</sup>
b <sup>2</sup>	46.3	+62	+8 37	255 24	139 46		g <sup>1</sup>	54.9	-1	-18 23	343 19	340 53	g <sup>5</sup>
c <sup>1</sup>	32.7	-278	-14 12	262 23	146 45		February 16 $0^h 43^m$						
c	30.5	-255	-13 33	265 12	149 34		a <sub>1</sub>	-32.6	+184	+12 36	261 2	286 24	
d <sup>1</sup>	26.2	+54	-8 32	319 5	203 27		a <sub>2</sub>	32.2	+210	+14 25	262 3	287 25	
d	28.3	+55	-8 51	321 2	205 24	a	a <sub>3</sub>	31.6	+208	+14 5	262 36	287 58	
d <sup>2</sup>	32.0	+62	-9 4	324 35	208 57	a <sup>2</sup>	a <sup>1</sup>	26.8	+243	+14 34	267 36	292 58	
February 12 $0^h 30^m$							a <sup>2</sup>	21.5	+330	+18 4	273 42	299 4	
a <sup>1</sup>	-54.1	-314	-7 33	229 15	198 21		b <sub>1</sub>	8.6	-74	-8 43	277 25	302 47	
a	53.3	-289	-6 35	231 38	200 44		b <sub>2</sub>	8.0	-42	-7 7	278 30	303 52	
a <sup>2</sup>	49.7	-290	-8 0	236 34	205 40		b <sup>1</sup>	4.1	-15::	-6 43	282 16	307 38	
b	36.3	-275	-11 49	252 14	221 20		b <sup>2</sup>	2.7	+1::	-6 13	283 43	309 5	
c	15.9	+451	+23 49	284 11	253 17		b <sup>3</sup>	1.6	-5	-6 50	284 28	309 50	
c <sup>1</sup>	7.5	+475	+22 56	292 4	261 10		b <sup>4</sup>	0.7	+3::	-6 38	285 21	310 43	
c <sup>2</sup>	6.8	+464	+22 2	292 28	261 34		c <sub>1</sub>	+0.2	+279	+8 42	291 10	316 32	
c <sup>3</sup>	6.1	+478	+22 44	293 24	262 30		c <sub>2</sub>	0.9	+284	+8 47	291 53	317 15	
d	5.4	-185	-15 48	297 49	266 55		c <sup>1</sup>	3.1	-157	+9 28	295 14	320 36	
e	22.8	+442	+13 27	317 54	287 0	b	d	4.3	+311	-16 34	285 30	310 52	
e <sup>1</sup>	25.5	+466	+14 23	321 8	290 14	b <sup>1</sup>	d <sup>1</sup>	6.5	-119	-15 22	289 6	314 28	
e <sup>2</sup>	28.8	+496	+15 35	325 19	294 25	c	d <sup>2</sup>	9.6	-117	-16 4	291 47	317 9	
f	48.3	+182	-6 20	338 13	307 19		d <sup>3</sup>	11.0	-135	-17 27	292 41	318 3	
f <sup>1</sup>	50.5	+200	-5 35	341 29	310 35		e <sup>1</sup>	7.9	-291	-25 36	287 6	312 28	
f <sup>2</sup>	51.3	+178	-6 58	342 9	311 15		e	11.5	-287	-26 22	290 28	315 50	d
g	51.3	+422	+7 36	349 49	318 55	d	e <sup>2</sup>	13.7	-261	-25 25	292 54	318 16	
g <sup>1</sup>	52.2	+452	+9 27	353 0	322 6	d <sup>1</sup>	e <sup>3</sup>	14.9	-286	-27 13	293 36	318 58	
h <sup>1</sup>	52.6	-138	-25 36	341 47	310 53		j	12.7	+142	-2 19	298 56	324 18	a
h <sup>2</sup>	53.4	-163	-27 12	343 15	312 21		g	27.3	-93	-19 4	308 7	333 29	C
h	55.0	-135	-25 42	345 40	314 46	e	g <sup>1</sup>	27.9	-84::	-18 42	308 51	334 13	
h <sup>3</sup>	55.6	-115	-24 34	346 31	315 37		g <sup>2</sup>	28.9	-102::	-19 57	309 34	334 56	
h <sup>4</sup>	56.2	-156	-27 5	347 54	317 0		g <sup>3</sup>	30.0	-68	-18 15	311 6	336 28	
							g <sup>4</sup>	33.4	-90::	-20 18	314 17	339 39	
							g <sup>5</sup>	34.3	-56	-18 31	315 35	340 57	

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1861 February 16—Continued						
$h$	+30.9	+406''	+ 8° 44'	321° 3'	346° 25'	
$i$	54.1	+408	+ 5 16	350 47	16 9	
$i^1$	55.4	+408	+ 5 13	353 28	18 50	
$k$	65.2	- 70	-23 16	6 50	32 12	$h$
February 22 0 <sup>h</sup> 13 <sup>m</sup>						
$a$	-55.4	-308	- 3 38	215 57	325 14	
$b$	54.1	-103	+ 6 21	225 45	335 2	
$b^1$	50.6	- 96	+ 5 10	230 49	340 6	
$c^1$	45.9	-462	-15 45	222 0	331 17	
$c^2$	45.0	-474	-16 46	222 28	331 45	
$c$	44.0	-495	-18 16	222 29	331 46	
$c^3$	42.0	-474	-18 4	226 24	335 41	
$c^4$	37.3	-503	-21 34	230 21	339 38	
$d$	42.9	-651	-26 27	210 8	319 25	
$e$	36.2	-311	-11 54	240 16	349 33	$a$
$e^1$	35.0	-285	-10 58	242 23	351 40	
$f$	23.2	+239	+13 34	265 13	14 30	
$f^1$	22.4	+276	+15 28	266 35	15 52	
$g$	4.3	+262	+ 8 43	281 54	31 11	$b$
$g^1$	0.6	+302	+ 9 56	285 30	34 47	$b^1$
$g^2$	+ 2.7	+315	+ 9 42	288 31	37 48	$b^3$
$h$	12.8	-222	-23 20	286 14	35 31	$d$
$h^1$	14.1	-257	-25 45	286 48	36 5	$d^2$
$h^2$	15.9	-227	-24 32	288 59	38 16	$d^3$
$i_1$	15.3	+520	+18 23	304 42	53 59	$c_1$
$i_2$	16.1	+521	+18 14	305 27	54 44	
$i^1$	18.6	+527	+17 56	307 57	57 14	$c_2$
$i^2$	19.9	+530	+17 45	309 19	58 36	$c^3$
$i^3$	20.7	+514	+16 33	309 27	58 44	
$i^4$	22.5	+535	+17 25	311 57	61 14	$c^4$
$i^5$	24.7	+549	+17 42	314 37	63 54	$c^5$
$i^6$	27.6	+582	+19 6	318 55	68 12	
$i^7$	29.6	+583	+18 42	321 5	70 22	$c^6$
$i^8$	30.4	+587	+18 46	322 13	71 30	
February 25 0 <sup>h</sup> 57 <sup>m</sup>						
$a$	-54.3	-507	-12 30	198 1	349 49	
$b$	43.5	+ 6	+ 8 22	238 22	30 10	$a$
$b^1$	42.2	+ 47	+10 5	240 39	32 27	$a^2$
$b^2$	42.2	+ 2	+ 7 37	239 44	31 32	$a^1$
$b^3$	39.3	+ 68	+10 8	244 2	35 50	
$c^1$	28.3	+307	+19 42	258 54	50 42	
$c_1$	25.0	+308	+18 30	262 2	53 50	$b_1$
$c_2$	23.6	+301	+17 34	263 9	54 57	$b_2$
$c^2$	20.3	+347	+17 44	266 31	58 19	$b^1$
$c^3$	17.8	+320	+16 35	268 41	60 29	$b^2$
$c^4$	13.8	+382	+18 54	273 22	65 10	$b^4$
February 26 0 <sup>h</sup> 48 <sup>m</sup>						
$a$	-52.7	- 83	+ 7 44	224 1	29 46	$a$
$a^1$	52.0	- 92	+ 6 56	224 45	30 30	
$a^2$	51.4	- 46	+ 9 8	226 42	32 27	$a^2$
$b_1$	37.2	+225	+18 27	247 52	53 37	$b_1$
$b_2$	36.3	+212	+17 17	248 39	54 24	$b_2$
$b^1$	33.4	+231	+17 15	251 49	57 34	$b^1$
$b^2$	30.9	+233	+16 22	254 19	60 4	$b^2$
$b^3$	28.6	+295	+19 10	257 32	63 17	$b_1^3$
$b^4$	26.4	+299	+18 35	259 38	65 23	$b^4$
$b^5$	22.9	+324	+18 45	263 17	69 2	$b^5$
$b^6$	20.5	+354	+19 39	266 3	71 48	
$b^7$	12.3	+270	+11 47	271 24	77 9	
$c$	32.2	-513	-23 26	230 57	36 42	$c$
$c^1$	28.9	-517	-25 3	234 10	39 55	
$d$	+ 8.6	+459	+16 9	293 25	99 10	$d$
$e$	11.0	+605	+24 38	300 24	106 9	
$f$	35.1	+424	+ 6 50	316 58	122 43	$e$
$g$	35.8	+638	+20 5	328 9	133 54	$F$
$h$	43.5	+477	+ 8 14	329 2	134 57	$g$
$h^1$	47.9	+478	+ 7 34	335 31	141 16	$g^1$
$h^2$	48.7	+503	+ 9 2	338 24	144 9	$g^3$
$i$	52.0	+111	-14 44	329 19	135 4	
$k$	59.5	+189	-11 9	344 28	150 13	
February 27 1 <sup>h</sup> 20 <sup>m</sup>						
$a$	-59.5	-166	+ 7 5	208 53	28 59	
$a^1$	58.9	-150	+ 7 33	210 46	30 52	$a$
$a^2$	58.4	-122	+ 8 46	212 40	32 46	
$a^3$	57.7	- 99	+ 9 35	214 39	34 45	$a^1$
$b_1$	48.1	+141	+18 22	233 19	53 25	$b_1$
$b_2$	47.5	+127	+17 17	233 53	53 59	$b_2$
$b^1$	45.4	+135	+16 45	236 31	56 37	$b^1$
$b^2$	42.8	+141	+16 2	239 35	59 41	$b^2$
$b_1^3$	40.4	+208	+18 55	243 18	63 24	$b^3$
$b_2^3$	40.4	+186	+17 37	242 58	63 4	
$b^4$	38.3	+210	+18 10	245 31	65 37	$b^4$



## 1861 February 27—Continued

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date	Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1861 February 27—Continued													
$b^5$	-35.7	+232''	+18° 22'	248° 36'	68° 42'	$b^6$ $c$ $D$	$a^1$	-59.1	-45''	+14° 29'	207° 57'	97° 54'	$a^1$ $a^2$ $a^3$ $a$ $a^4$
$b^6$	34.9	+286	+21 17	250 15	70 21		$a^2$	58.1	-9	+15 53	210 42	100 39	
$c$	39.2	-586	-23 52	216 42	36 48		$a^3$	57.4	+9	+16 31	212 17	102 14	
$d$	4.2	+403	+16 49	280 14	100 20		$a^4$	57.4	+39	+18 14	212 46	102 43	
$e$	+22.5	+362	+6 16	301 53	121 59		$b$	35.1	-438	-17 14	225 14	115 11	
$f$	27.2	+586	+18 32	314 22	134 28	$g$ $h$ $h^1 h^2$ $h^4$ $k^1 ? k$	$b^1$	31.1	-420	-18 1	230 11	120 8	$a^1$ $a^2$ $a^3$ $a$ $a^4$
$f^1$	27.9	+629	+21 9	317 18	137 24		$c$	33.2	+52	+7 43	242 49	132 46	
$g$	32.9	+433	+8 2	313 55	134 1		$c^1$	28.9	+75	+7 15	247 20	137 17	
$g^1$	38.6	+440	+6 47	320 29	140 35		$c_1^2$	24.8	+138	+9 9	252 17	142 14	
$g^2$	41.2	+454	+7 5	324 8	144 14		$c_2^2$	25.0	+65	+5 13	250 31	140 28	
$g^3$	41.9	+474	+8 9	325 50	145 56	$h^1 h^2$ $h^4$ $k^1 ? k$	$c_3^2$	20.9	+168	+9 20	256 18	146 15	$a^3$ $a$ $a^4$
$g^4$	43.4	+471	+7 39	327 43	147 49		$c^3$	20.9	+126	+7 0	255 24	145 21	
$h$	63.7	+122	-15 15	354 21	174 27		$c^4$	18.8	+112	+5 26	256 55	146 52	
							$d^1$	14.2	+224	+9 59	263 10	153 7	
							$d^2$	13.0	+231	+9 56	264 19	154 16	
February 28 1 <sup>h</sup> 13 <sup>m</sup>													
$a$	-62.7	-197	+7 57	197 4	31 8	$A$	$d^3$	12.1	+254	+10 55	265 35	155 32	$a^6$ $a^7$ $b_1 b_2$
$a^1$	62.8	-155	+10 7	199 0	33 4		$d^4$	9.6	+274	+11 10	268 6	158 3	
$b_1$	56.5	+87	+19 35	219 16	53 20		$d^5$	8.9	+297	+12 12	269 15	159 12	
$b_2$	55.9	+77	+18 42	220 6	54 10		$d^6$	8.2	+272	+10 31	269 15	159 12	
$b^1$	54.8	+76	+18 5	221 53	55 57		$d$	6.8	+281	+10 32	270 36	160 33	
$b^2$	52.4	+77	+16 53	225 38	59 42	$B$	$e$	+16.4	-98	-18 0	281 19	171 16	$b_1 b_2$ $b^2$ $c$ $c_1^1$ $c_2^1$ $c^3$
$b^3$	50.0	+148	+19 53	229 54	63 58		$e^1$	21.0	-49	-16 44	286 29	176 26	
$b^4$	48.4	+147	+19 5	231 57	66 1		$e^2$	28.3	-45	-18 44	293 26	183 23	
$b^5$	48.3	+122	+17 34	231 46	65 50		$e^3$	29.2	-21	-17 39	294 44	184 41	
$b^6$	46.0	+206	+21 29	235 43	69 47		$e^4$	33.0	+25	-16 10	299 21	189 18	
$c$	43.7	-631	-23 31	204 18	38 22	$C$	$e^5$	37.4	+15	-17 56	303 45	193 42	$c$ $c_1^1$ $c_2^1$ $c^3$
$d$	19.5	+309	+16 41	264 11	98 15		$f$	48.5	+5	-21 18	317 5	207 2	
$d^1$	16.0	+346	+17 35	267 59	102 3		$f_1$	49.5	+5	-21 33	318 35	208 32	
$e^1$	+9.3	+748	+35 10	304 12	138 16		$f_2$	50.5	+9	-21 33	320 5	210 2	
$e$	9.8	+724	+33 10	303 15	137 19		$f^1$	53.3	-35	-24 41	324 6	214 3	
$f$	15.1	-94	-17 8	284 22	118 26	$D$	March 7 1 <sup>h</sup> 21 <sup>m</sup>						
$f^1$	17.8	-96	-18 5	286 44	120 48		$a^1$	-59.1	-186	+7 48	200 0	132 23	$a$ $c$ $c^1$ $c^2$
$g$	17.7	+599	+21 54	304 41	138 45		$a^2$	57.7	-177	+7 26	203 19	135 42	
$h$	20.7	+394	+8 31	300 13	134 17		$a^3$	56.5	-175	+6 50	205 42	138 5	
$h^1$	26.2	+410	+7 56	305 47	139 51		$a^4$	52.7	-102	+8 37	214 9	146 32	
$h^2$	27.5	+403	+7 10	306 47	140 51	$a$	52.3	-68	+10 13	215 39	148 2		
$h^3$	28.8	+400	+6 39	307 57	142 1	$E$	$a^5$	46.2	-37	+8 56	224 16	156 39	$a$ $c$ $c^1$ $c^2$
$h^4$	31.1	+440	+8 24	311 33	145 37		$a^6$	44.5	+34	+12 2	227 50	160 13	
$h^5$	31.7	+448	+8 44	312 23	146 27		$a^7$	43.3	+14	+10 22	228 45	161 8	
$i$	44.4	+169	-10 19	318 25	152 29		$b_1$	22.3	-348	-17 29	238 7	170 30	
$i^1$	47.0	+176	-10 28	321 48	155 52		$b_2$	21.4	-346	-17 42	239 9	171 32	
$k^1$	58.5	+134	-14 47	339 12	173 16	$F$	$b^1$	18.1	-315	-17 24	242 59	175 22	$a$ $c$ $c^1$ $c^2$
$k$	59.0	+141	-14 25	340 24	174 28		$b^2$	9.4	-256	-17 37	252 17	184 40	
$l$	62.6	+103	-16 45	349 6	183 10		$c$	+14.0	-179	-21 51	274 19	206 42	
							$c_1^1$	15.8	-168	-21 53	276 11	208 34	
							$c_2^1$	16.6	-165	-21 58	276 58	209 21	
March 4 0 <sup>h</sup> 46 <sup>m</sup>													
$a_1$	-61.3	-39	+16 14	202 53	92 50	$F$	$c^2$	21.5	-140	-22 12	282 1	214 24	$a$ $c$ $c^1$ $c^2$
$a_2$	61.3	-65	+14 49	202 15	92 12		$c^3$	24.1	-161	-24 15	284 6	216 29	
							$d$	46.3	+130	-14 9	313 13	245 36	

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1861 March 7—Continued						
$d^1$	+49°0	+156''	-13° 18'	317° 24'	249° 47'	
$d^2$	49.9	+158	-13 23	318 42	251 5	
March 11 0 <sup>h</sup> 36 <sup>m</sup>						
$a$	-49.1	-603	-16 16	182 39	170 44	
$a^1$	47.3	-631	-18 38	183 21	171 26	
$b_1$	33.3	-293	-9 32	225 55	214 0	
$b_2$	32.5	-291	-9 44	226 40	214 45	
$b_1^1$	26.6	-275	-11 26	232 44	220 49	
$b_2^1$	26.6	-286	-12 0	232 21	220 26	
$c$	31.0	-493	-20 47	219 13	207 18	
$c^1$	29.2	-480	-20 56	221 44	209 49	
$c^2$	22.2	-498	-25 3	227 36	215 41	
$d$	15.1	-91	-6 24	248 4	236 9	$B$
$e$	12.2	+253	+11 6	258 54	246 59	$a$
$e^1$	6.9	+323	+13 3	264 59	253 4	$a^1?$
$e^2$	4.9	+340	+13 17	267 1	255 6	
$f$	37.4	+157	-10 49	299 38	287 43	
$g$	61.0	0	-25 6	334 1	322 6	$d$
$h$	62.6	+93	-19 36	340 18	328 23	$f$
March 15 23 <sup>h</sup> 51 <sup>m</sup>						
$a$	-55.6	-99	+11 45	202 33	246 20	$a$
$a^1$	50.3	-59	+11 0	211 36	255 23	$a^2$
$b$	52.2	-454	-7 29	190 10	233 57	$b$
$b^1$	49.7	-415	-7 9	197 40	241 27	
$c^1$	13.5	+381	+20 14	258 38	302 25	$c^1$
$c$	7.6	+413	+18 34	264 33	308 20	$c$
$d$	+27.7	-157	-25 41	280 26	324 13	$e$
$e$	30.2	+152	-9 15	289 15	333 2	$f$
$e^1$	34.2	+126	-11 56	292 37	336 24	$f^2$
$f$	32.2	-59	-21 37	286 49	330 36	$g^1$
$g$	44.5	+465	+4 26	315 28	359 15	
$h$	55.2	+182	-14 16	321 9	4 56	$h^4$
$i$	61.2	+219	-12 41	337 15	21 2	$k$
March 16 0 <sup>h</sup> 24 <sup>m</sup>						
$a$	-60.4	-161	+11 41	188 13	246 21	
$a^1$	58.8	-131	+12 9	193 19	251 27	
$a^2$	57.2	-133	+11 3	196 32	254 40	
$b$	54.3	-503	-7 47	176 5	234 13	
$c^1$	26.9	+288	+19 32	242 10	300 18	
$c^2$	20.6	+316	+18 24	248 28	306 36	
$c$	19.5	+324	+18 22	249 37	307 45	
$d$	+10.4	-75	-14 55	264 16	322 24	
$e$	16.0	-228	-25 27	265 30	323 38	
$f$	16.9	+77	-9 0	273 27	331 35	$a$
Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
$f^1$	+19°7	+78''	-9° 55'	275° 55'	334° 3'	$a^2$
$f^2$	22.4	+63	-11 38	277 57	336 5	
$g^1$	19.1	-131	-21 11	270 38	328 46	
$g$	26.6	-72	-20 31	278 56	337 4	
$h^1$	40.7	+147	-12 46	298 6	356 14	$b$
$h^2$	41.8	+163	-12 11	299 44	357 52	
$h$	45.1	+211	-10 24	304 55	3 3	$b^2?$
$h^3$	46.6	+205	-11 8	306 41	4 49	
$h^4$	47.1	+154	-14 8	306 5	4 13	
$i$	49.0	+507	+6 1	323 26	21 34	$c$
$k$	56.2	+216	-12 36	322 9	20 17	$d$
March 18 1 <sup>h</sup> 53 <sup>m</sup>						
$a$	-10.4	-122	-9 27	243 56	331 0	$b$
$a^1$	9.3	-109	-9 13	245 14	332 18	
$a^2$	7.4	-102	-9 37	246 57	334 1	
$b$	+15.2	-7	-12 58	267 56	355 0	$d^2 d^1$
$b^1$	20.1	+58	-11 10	273 43	0 47	$d^3$
$b^2$	23.1	+81	-10 56	276 55	3 59	$d^5$
$c$	31.1	+438	+6 18	294 36	21 40	$e$
$d$	38.0	+130	-13 3	292 39	19 43	$f$
$e$	41.8	+678	+18 29	324 13	51 17	$g$
March 19 2 <sup>h</sup> 5 <sup>m</sup>						
$a^1$	-46.3	-626	-17 51	178 18	279 31	
$a^s$		-606				
$a_n$	45.8	-598	-17 15	182 59	284 12	
$b$	23.6	-221	-9 8	228 57	330 10	$a$
$c$	16.0	-397	-21 36	229 11	330 24	
$d$	+0.3	-115	-13 12	251 46	352 59	$c_1 c_2$
$d^1$	3.3	-76	-12 17	255 17	356 30	$c^1$
$d^2$	4.6	-83	-13 9	256 10	357 23	$c^2$
$d^3$	6.8	-32	-11 14	259 16	0 29	$c^3$
$d^4$	9.1	+18	-9 25	262 24	3 37	
$d^5$	10.8	0	-10 58	263 20	4 33	$c^4$
$e$	19.1	+370	+6 17	280 9	21 22	$d$
$f$	26.0	+60	-13 4	278 3	19 16	$e$
$g^1$	32.6	+692	+21 29	309 28	50 41	$f^1$
$g$	35.2	+657	+18 24	310 5	51 18	$f$
$h$	38.2	+64	-16 51	290 27	31 40	
March 20 0 <sup>h</sup> 23 <sup>m</sup>						
$a$	-33.6	-307	-9 2	215 46	330 1	$a$
$b$	15.0	+76	+3 8	243 41	357 56	$b$
$b^1$	13.3	+107	+3 56	245 41	359 56	
$b^2$	10.7	+102	+2 38	247 40	1 55	
$c_1$	12.5	-209	-13 4	237 44	351 59	$c_1$
$c_2$	11.9	-204	-13 3	238 23	352 38	$c_2$
$c^1$	9.0	-172	-12 33	241 43	355 58	



## 1861 March 20—Continued

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$c^2$	-7 <sup>s</sup> .2	-167''	-13° 2'	243° 22'	357° 37'	
$c^3$	5.4	-115	-11 0	246 15	0 30	
$c^4$	1.6	-83	-10 45	250 11	4 26	
$d$	+7.3	+300	+6 33	267 18	21 33	$d$
$d^1$	8.1	+351	+9 7	269 25	23 40	
$d^2$	9.9	+339	+7 47	270 33	24 48	
$e$	14.2	-5	-12 30	265 12	19 27	$e$
$f^1$	25.2	+652	+21 4	297 1	51 16	
$f$	27.8	+628	+18 40	298 22	52 37	$f$
$g$	42.4	+614	+13 45	316 36	70 51	$g$
$h$	46.4	+636	+14 43	328 3	82 18	$h$
$i$	57.3	+309	-7 40	324 44	78 59	$i$

March 22 0<sup>h</sup> 20<sup>m</sup>

$a$	-49.1	-466	-8 55	186 52	329 10	
$b$	38.2	-106	+3 31	216 8	358 26	$a$
$c_1$	35.1	-395	-12 36	208 38	350 56	$b$
$c_2$	34.4	-393	-12 50	209 26	351 44	
$d$	19.4	+107	+5 31	236 47	19 5	
$e$	12.1	-186	-11 55	236 47	19 5	$c$
$e^1$	+0.2	-163	-15 38	247 28	29 46	
$e^2$	3.2	-157	-16 30	250 6	32 24	
$e^3$	6.3	-160	-17 52	252 34	34 52	
$f$	6.3	+507	+18 54	271 0	53 18	$d$
$g$	21.7	+533	+14 46	285 38	67 56	$e$
$g^1$	28.8	+542	+12 57	292 59	75 17	$e^4$
$h$	33.6	+603	+15 12	301 32	83 50	$f$
$h^1$	33.9	+623	+16 19	303 12	85 30	$g$
$i$	41.4	+241	-7 22	295 17	77 35	$h$
$k$	44.2	+619	+13 34	318 34	100 52	$F$
$l^1$	51.2	+510	+3 51	320 42	103 0	$k$
$l$	51.2	+487	+5 20	322 51	105 9	

March 23 0<sup>h</sup> 19<sup>m</sup>

$a$	-48.0	-201	+3 25	201 10	357 29	
$b$	42.2	-486	-13 29	194 37	350 56	
$c^1$	25.0	-277	-11 6	221 52	18 11	
$c$	23.8	-294	-12 27	222 22	18 41	$a$
$d$	6.1	+411	+18 10	256 39	52 58	$b$
$d^1$	1.7	+472	+19 58	262 14	58 33	
$d^2$	+1.6	+415	+15 17	263 7	59 26	
$e$	8.5	+450	+14 40	269 55	66 14	$c$
$e^1$	11.1	+463	+14 27	272 36	68 55	
$e^2$	12.0	+477	+14 56	273 52	70 11	
$e^3$	13.1	+456	+13 18	274 4	70 23	$c^1$
$e^4$	15.7	+472	+13 18	276 50	73 9	
$f$	23.5	+546	+14 56	286 54	83 13	$d$
$g$	23.9	+572	+16 22	288 33	84 52	$e$

$h$	+30 <sup>s</sup> .6	+162''	-9° 7'	280° 57'	77° 16'	$f$
$i$	33.9	+645	+17 44	303 48	100 7	
$i^1$	34.9	+636	+16 52	304 26	100 45	
$i^2$	35.8	+614	+15 13	304 0	100 19	
$i^3$	37.7	+601	+13 51	305 38	101 57	
$k$	43.7	+449	+3 3	304 55	101 14	$G$
$k^1$	44.3	+483	+4 55	307 25	103 44	
$k^2$	45.4	+517	+6 43	311 15	107 34	
$l$	52.0	+553	+8 17	330 44	127 3	$h_1 h_2$

March 25 0<sup>h</sup> 26<sup>m</sup>

$a$	-42.3	-457	-11 57	194 21	18 48	
$b$	30.6	+227	+18 17	228 48	53 15	$a$
$c$	17.1	+260	+14 13	241 55	66 22	$b$
$c^1$	12.4	+265	+12 23	245 37	70 4	
$d$	0.8	+403	+15 31	258 53	83 20	$c$
$e$	+0.4	+434	+16 52	260 47	85 14	$c^1$
$f$	5.2	0	-8 50	252 48	77 15	
$g$	24.8	+401	+5 57	280 34	105 1	$E$
$h_1$	41.0	+531	+8 32	303 40	128 7	$f_1$
$h_2$	41.7	+536	+8 39	304 55	129 22	$f_2$
$i$	48.0	+581	+10 12	319 54	144 21	$i$
$k$	53.0	+317	-6 57	311 16	135 43	$h$
$k^1$	55.1	+319	-2 56	319 39	144 6	
$l$	54.2	+209	-13 26	309 26	133 53	$k^1$
$l^1$	56.8	+214	-13 39	314 37	139 4	$l_1$
$l^2$	61.0	+242	-12 19	327 44	152 11	$m^1$

March 28 3<sup>h</sup> 20<sup>m</sup>

$a$	-57.8	-26	+18 29	186 20	54 36	
$b$	50.3	-29	+13 59	198 23	66 39	
$c$	38.7	+107	+15 33	215 7	83 23	$a$
$c^1$	37.4	+166	+17 6	217 18	85 34	$a^3$
$d$	26.3	+254	+18 1	230 23	98 39	
$e_1$	16.3	+84	+4 13	234 41	102 57	$b$
$e_2$	16.3	+70	+3 32	234 19	102 35	
$e^1$	15.4	+119	+5 47	236 20	104 36	
$e^2$	13.5	+137	+5 57	238 20	106 36	
$e^3$	12.3	+149	+6 6	239 37	107 53	$b^1$
$e^4$	12.3	+121	+4 35	238 54	107 10	
$f^1$	+6.6	+352	+9 47	260 21	128 37	$d^1$
$f_1$	7.7	+325	+7 51	260 27	128 43	$d$
$f_2$	8.4	+329	+7 49	261 6	129 22	
$g$	12.4	+400	+10 19	266 39	134 55	$e$
$g^1$	14.5	+389	+8 54	268 4	136 20	
$g^2$	16.4	+420	+9 58	270 43	138 59	$h^1$
$g^3$	17.2	+427	+10 5	271 39	139 55	
$g^4$	18.3	+418	+9 10	272 18	140 34	$h^2$
$h$	19.2	+137	-6 37	264 51	133 7	$f$
$i^1$	16.4	+462	+12 23	272 11	140 27	

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date	Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1861 March 28—Continued													
$i^2$	+19.50	+448"	+10° 38'	273° 58'	142° 14'	$h^4$	$i^1$	-15.51	-243"	-13° 3'	223° 27'	132° 35'	
$i^1$	21.7	+477	+10 13	277 35	145 51	$h$	$i$	13.8	-266	-14 50	223 48	132 56	
$i^s$	23.2	+448					$k^1$	+ 1.7	-129	-13 57	240 30	149 38	
$k^1$	22.2	+ 36	-13 9	264 56	133 12	$i^1$	$k^2$	2.3	-138	-14 39	240 48	149 56	
$k$		+ 10	-14 34	264 19	132 35	$i$	$k$	3.9	-122	-14 29	242 32	151 40	$h$
$l^1$	25.4	+ 58	-13 7	268 24	136 40		$k^3$	7.2	-137	-16 35	244 51	153 59	
$l_1$	28.4	+ 72	-13 24	271 32	139 48		$k^4$	9.4	-172	-19 21	245 43	154 51	$h^4$
$l_2$	29.0	+ 61	-14 13	271 52	140 8		$k^5$	11.1	-103	-16 17	249 1	158 9	$h^3$
$m$	37.6	+114	-14 12	281 48	150 4	$k^1$	$k^6$	12.4	-197	-21 56	247 40	156 48	
$m^1$	38.8	+167	-11 38	284 23	152 39	$k^2$	$k^7$	13.0	-138	-18 54	249 41	158 49	
$m^2$	41.3	+192	-11 2	287 51	156 7	$k$	$k^8$	13.4	- 69	-15 16	251 49	160 57	
$m^3$	44.9	+118	-16 14	290 18	158 34	$k^5$	$k^9$	16.9	-129	-19 56	253 19	162 27	
$n$	44.4	+ 52	-19 49	288 22	156 38	$k^4$	$k^{10}$	18.7	-137	-21 6	254 46	163 54	
$n^1$	45.4	+ 61	-19 37	289 49	158 5		$l^1$	35.3	+596	+14 6	294 33	203 41	
$n^2$	47.6	+ 81	-19 8	293 7	161 23	$k^9$	$l$	39.8	+579	+11 47	299 16	208 24	
$n^3$	49.0	+ 49	-21 22	294 30	162 46	$k^{10}?$	$m^1$	44.6	-195	-34 11	282 15	191 23	I
$n^4$	49.4	+ 72	-20 7	295 28	163 44		$m$	46.6	-213	-36 2	285 18	194 26	
March 31 1 <sup>h</sup> 14 <sup>m</sup>							$n$	47.7	+ 55	-20 30	289 40	198 48	K
							$n^1$	49.3	+ 44	-21 38	291 49	200 57	
							$o$	50.3	+236	-11 4	297 45	206 53	N
							$p$	60.3	+131	-19 12	314 24	223 32	
							$p^1$	61.5	+126	-19 36	318 1	227 9	
							April 4 0 <sup>h</sup> 44 <sup>m</sup>						
$a^1$	-62.5	-176	+14 14	164 33	73 41		$a$	-63.8	+ 33	+26 53	161 50	126 49	
$a^2$	61.7	-169	+13 54	168 23	77 31		$b$	61.4	+ 77	+27 20	172 23	137 22	$a$
$a$	60.6	-108	+16 10	174 37	83 45		$c$	60.6	-210	+11 8	166 7	131 6	
$a^3$	60.0	- 78	+17 20	177 11	86 19		$d$	60.1	-276	+ 7 37	163 14	128 13	
$b$	48.9	-211	+ 4 3	191 43	100 51		$e$	57.3	-202	+ 9 20	174 48	139 47	$b^1$
$b^1$	45.6	-133	+ 6 22	198 28	107 36	$a?$	$f^1$	55.4	-117	+11 47	181 2	146 1	$b$
$c$	39.0	+275	+25 47	215 21	124 29		$f^s$		-147				
$c^1$	37.5	+270	+24 42	216 55	126 3		$f^1$	54.4	-201	+ 7 41	180 12	145 11	$b^2$
$c^2$	35.8	+299	+25 38	219 13	128 21		$f^2$	54.0	-195	+ 7 45	181 10	146 9	
$c^3$	33.9	+292	+24 13	221 5	130 13		$f^3$	53.2	- 96	+12 27	185 42	150 41	$b^3$
$c^4$	33.3	+307	+24 45	222 2	131 10	$b$	$g$	54.2	-453	- 4 20	164 22	129 21	
$c^5$	32.1	+356	+27 10	224 17	133 25		$h$	39.4	-492	-14 25	185 52	150 51	$d$
$d^1$	31.3	+ 58	+ 9 43	218 18	127 26	$d$	$h^1$	38.0	-510	-16 0	186 23	151 22	$d^1$
$d$	30.0	+ 39	+ 8 5	219 2	128 10		$h^2$	36.9	-478	-14 58	189 33	154 32	$d^2$
$d^2$	28.1	+ 52	+ 7 57	221 2	130 10		$h^3$	34.6	-471	-15 43	192 23	157 22	$d^3$
$e$	28.1	+108	+10 41	222 21	131 29	$c$	$h^4$	34.1	-539	-19 24	188 55	153 54	$d^4$
$f$	21.9	-149	- 5 17	220 48	129 56	$g$	$i^1$		-476	-31 50	221 42	186 41	$e$
$f^1$	19.8	-147	- 6 4	222 34	131 42		$i^s$	1.8	-494				
$g$	20.5	+528	+32 35	239 50	148 58		$i^1$	+ 1.2	-445	-30 54	226 0	190 59	$e^1?$
$g^1$	20.5	+559	+34 43	240 45	149 53		$i^2$	3.5	-440	-31 38	228 12	193 11	$e^3$
$h^1$	21.3	+153	+10 22	229 31	138 39	$e$	$i^3$	3.5	-486	-34 20	226 21	191 20	$e^2$
$h^2$	18.7	+153	+ 9 20	231 38	140 46		$i^4$	6.2	-444	-33 6	230 29	195 28	$e^4$
$h^3$	17.5	+241	+13 41	234 52	144 0		$i^5$	9.7	-460	-35 41	233 11	198 10	$e^5$
$h^4$	17.0	+195	+10 54	234 7	143 15		$k^1$	- 0.3	-262	-20 3	231 4	196 3	$f^1$
$h^s$	15.2	+225	+10 26	236 34	145 42	$f$	$k^2$	+ 0.6	-248	-19 40	232 15	197 14	
$h^5$	13.9	+261	+13 15	238 22	147 30		$k$	4.5	-236	-20 37	235 49	200 48	$f^3 f$
$h^6$	12.5	+149	+ 6 29	236 39	145 47		$k^3$	7.0	-235	-21 36	237 59	202 58	
$h^7$	11.5	+184	+ 8 0	238 19	147 27								



Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date	Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1861 April 4—Continued													
$l$	$+11^{\circ}3'$	$+133''$	$-4^{\circ}6'$	$251^{\circ}31'$	$216^{\circ}30'$	$g$	$i^3$	$+20^{\circ}2'$	$-165''$	$-22^{\circ}58'$	$250^{\circ}26'$	$229^{\circ}33'$	$i$
$l^1$	$12.4$	$+117$					$k$	$18.1$	$+419$	$+9^{\circ}47'$	$264^{\circ}28'$	$243^{\circ}35'$	
$l^2$	$16.5$	$+150$	$-4^{\circ}22'$	$256^{\circ}0'$	$220^{\circ}59'$	$g^2$	$l$	$53.4$	$+151$	$-16^{\circ}35'$	$295^{\circ}11'$	$274^{\circ}18'$	
$l^3$	$18.2$	$+108$	$-7^{\circ}22'$	$256^{\circ}23'$	$221^{\circ}22'$		$l^1$	$55.2$	$+134$	$-18^{\circ}0'$	$297^{\circ}54'$	$277^{\circ}1'$	
$l^4$	$18.9$	$+132$	$-6^{\circ}19'$	$257^{\circ}34'$	$222^{\circ}33'$		April 6 0 <sup>h</sup> 31 <sup>m</sup>						
$l^5$	$20.0$	$+126$	$-7^{\circ}4'$	$258^{\circ}24'$	$223^{\circ}23'$	$g^3$	$a$	$-62.4$	$-224$	$+12^{\circ}4'$	$155^{\circ}5'$	$148^{\circ}0'$	
$m$	$21.1$	$+542$	$+15^{\circ}47'$	$272^{\circ}58'$	$237^{\circ}57'$	$h$	$b$	$48.2$	$-607$	$-14^{\circ}39'$	$158^{\circ}16'$	$151^{\circ}11'$	
$n$	$22.6$	$-85$	$-19^{\circ}29'$	$255^{\circ}32'$	$220^{\circ}31'$	$i^1$	$c$	$43.7$	$-660$	$-19^{\circ}48'$	$161^{\circ}35'$	$154^{\circ}30'$	
$n^1$	$24.1$	$-63$	$-18^{\circ}50'$	$257^{\circ}23'$	$222^{\circ}22'$		$d$	$22.3$	$-647$	$-31^{\circ}50'$	$191^{\circ}37'$	$184^{\circ}32'$	$c$
$n^2$	$26.2$	$-38$	$-18^{\circ}15'$	$259^{\circ}58'$	$224^{\circ}57'$	$i$	$d^1$	$20.8$	$-669$				
$n^3$	$30.1$	$-9$	$-18^{\circ}3'$	$264^{\circ}18'$	$229^{\circ}17'$		$d^2$	$15.8$	$-598$	$-31^{\circ}29'$	$201^{\circ}23'$	$194^{\circ}18'$	$c^1$
$n^4$	$31.0$	$-26$	$-19^{\circ}20'$	$264^{\circ}53'$	$229^{\circ}52'$	$i^2$	$d^3$	$13.9$	$-634$	$-34^{\circ}26'$	$200^{\circ}44'$	$193^{\circ}39'$	$c^2$
$n^5$	$32.6$	$-26$	$-19^{\circ}53'$	$266^{\circ}27'$	$231^{\circ}26'$		$e^1$	$11.8$	$-601$	$-33^{\circ}36'$	$204^{\circ}49'$	$197^{\circ}44'$	$c^3$
$o$	$29.4$	$+494$	$+10^{\circ}3'$	$278^{\circ}46'$	$243^{\circ}45'$	$k$	$e^2$	$21.4$	$-433$	$-19^{\circ}55'$	$205^{\circ}1'$	$197^{\circ}56'$	$a$
$p$	$59.6$	$+180$	$-16^{\circ}15'$	$309^{\circ}37'$	$274^{\circ}36'$	$l$	$e^3$	$20.6$	$-422$	$-19^{\circ}39'$	$206^{\circ}10'$	$199^{\circ}5'$	
April 5 0 <sup>h</sup> 55 <sup>m</sup>							$e$	$19.4$	$-433$	$-20^{\circ}49'$	$206^{\circ}47'$	$199^{\circ}42'$	
$a$	$-63.8$	$+37$	$+27^{\circ}7'$	$161^{\circ}5'$	$140^{\circ}12'$		$e^4$	$18.7$	$-425$	$-20^{\circ}43'$	$207^{\circ}45'$	$200^{\circ}40'$	
$b^1$	$61.1$	$-252$	$+9^{\circ}33'$	$160^{\circ}19'$	$139^{\circ}26'$		$e^5$	$18.0$	$-424$	$-20^{\circ}57'$	$208^{\circ}21'$	$201^{\circ}16'$	$a^1$
$b^2$	$60.4$	$-178$	$+11^{\circ}55'$	$166^{\circ}55'$	$146^{\circ}2'$	$a$	$f$	$16.7$	$-74$	$-3^{\circ}10'$	$221^{\circ}24'$	$214^{\circ}19'$	$b$
$b^3$	$59.2$	$-266$	$+7^{\circ}27'$	$165^{\circ}49'$	$144^{\circ}56'$		$f^1$	$15.1$	$-60$	$-3^{\circ}8'$	$223^{\circ}5'$	$216^{\circ}0'$	
$c$	$59.0$	$-181$	$+11^{\circ}29'$	$171^{\circ}3'$	$150^{\circ}10'$		$f^2$	$12.2$	$-58$	$-4^{\circ}13'$	$225^{\circ}28'$	$218^{\circ}23'$	$b^1$
$d$	$45.2$	$-564$	$-14^{\circ}44'$	$171^{\circ}22'$	$150^{\circ}29'$	$b$	$f^3$	$8.5$	$-83$	$-7^{\circ}3'$	$227^{\circ}44'$	$220^{\circ}39'$	
$d^1$	$43.2$	$-557$	$-17^{\circ}22'$	$171^{\circ}28'$	$150^{\circ}35'$		$f^4$	$6.3$	$-60$	$-6^{\circ}44'$	$230^{\circ}10'$	$223^{\circ}5'$	$b^3$
$d^2$	$43.2$	$-597$	$-15^{\circ}31'$	$175^{\circ}11'$	$154^{\circ}18'$		$g^1$	$5.5$	$+388$	$+17^{\circ}21'$	$242^{\circ}58'$	$235^{\circ}53'$	$e^1$
$d^3$	$41.8$	$-546$	$-15^{\circ}45'$	$178^{\circ}7'$	$157^{\circ}14'$		$g$	$2.4$	$+390$	$+16^{\circ}10'$	$245^{\circ}36'$	$238^{\circ}31'$	$e$
$d^4$	$40.2$	$-612$	$-19^{\circ}45'$	$174^{\circ}41'$	$153^{\circ}48'$	$c$	$h^1$	$1.7$	$-254$	$-18^{\circ}56'$	$228^{\circ}14'$	$221^{\circ}9'$	$f^1$
$e$	$13.9$	$-559$	$-31^{\circ}28'$	$206^{\circ}2'$	$185^{\circ}9'$	$d$	$h^2$	$1.0$	$-233$	$-18^{\circ}4'$	$229^{\circ}25'$	$222^{\circ}20'$	
$e^1$	$8.2$	$-546$	$-32^{\circ}16'$	$212^{\circ}8'$	$191^{\circ}15'$		$h$	$+1.7$	$-205$	$-17^{\circ}39'$	$232^{\circ}26'$	$225^{\circ}21'$	$f$
$e^2$	$6.9$	$-566$	$-34^{\circ}4'$	$212^{\circ}17'$	$191^{\circ}24'$	$d^2$	$h^3$	$5.6$	$-180$	$-17^{\circ}54'$	$236^{\circ}24'$	$229^{\circ}19'$	$f^2$
$e^3$	$6.2$	$-525$	$-32^{\circ}2'$	$215^{\circ}1'$	$194^{\circ}8'$	$d^1$	$h^4$	$8.3$	$-201$	$-20^{\circ}8'$	$238^{\circ}4'$	$230^{\circ}59'$	
$e^4$	$3.4$	$-528$	$-33^{\circ}31'$	$217^{\circ}19'$	$196^{\circ}26'$	$d^3$	$i$	$5.6$	$+338$	$+10^{\circ}2'$	$250^{\circ}27'$	$243^{\circ}22'$	
$e^5$	$0.4$	$-534$	$-35^{\circ}18'$	$219^{\circ}44'$	$198^{\circ}51'$		April 7 0 <sup>h</sup> 13 <sup>m</sup>						
$f^1$	$12.6$	$-365$	$-20^{\circ}18'$	$216^{\circ}22'$	$195^{\circ}29'$		$a$	$-31.0$	$-530$	$-20^{\circ}21'$	$189^{\circ}54'$	$196^{\circ}41'$	$b$
$f^2$	$9.8$	$-347$	$-20^{\circ}32'$	$219^{\circ}20'$	$198^{\circ}27'$	$E$	$a^1$	$28.3$	$-508$	$-20^{\circ}32'$	$193^{\circ}52'$	$200^{\circ}39'$	$b^1$
$f^3$	$9.1$	$-331$	$-19^{\circ}59'$	$220^{\circ}31'$	$199^{\circ}38'$		$b$	$29.4$	$-174$	$-2^{\circ}55'$	$206^{\circ}43'$	$213^{\circ}30'$	$a$
$f$	$7.8$	$-340$	$-21^{\circ}2'$	$221^{\circ}16'$	$200^{\circ}23'$		$b^1$	$26.1$	$-160$	$-3^{\circ}38'$	$210^{\circ}3'$	$216^{\circ}50'$	$a^1$
$g$	$6.6$	$+28$	$-2^{\circ}14'$	$233^{\circ}37'$	$212^{\circ}44'$	$f$	$b^2$	$24.5$	$-132$	$-2^{\circ}51'$	$212^{\circ}15'$	$219^{\circ}2'$	
$g^1$	$3.2$	$+15$	$-4^{\circ}7'$	$235^{\circ}38'$	$214^{\circ}45'$		$b^3$	$19.1$	$-158$	$-6^{\circ}32'$	$216^{\circ}2'$	$222^{\circ}49'$	$a^3$
$g^2$	$0.9$	$+44$	$-3^{\circ}29'$	$238^{\circ}14'$	$217^{\circ}21'$	$f^2$	$c$	$28.3$	$-717$	$-32^{\circ}24'$	$177^{\circ}18'$	$184^{\circ}5'$	$c_1, c_2$
$g^3$	$+2.6$	$+33$	$-5^{\circ}25'$	$240^{\circ}40'$	$219^{\circ}48'$	$f^4$	$c^1$	$27.0$	$-743$				
$h$	$6.8$	$+469$	$+16^{\circ}58'$	$256^{\circ}40'$	$235^{\circ}47'$	$g$	$c^2$	$22.2$	$-669$	$-32^{\circ}5'$	$189^{\circ}9'$	$195^{\circ}56'$	
$i^1$	$9.6$	$-181$	$-19^{\circ}38'$	$240^{\circ}42'$	$219^{\circ}49'$	$h^1$	$c^3$	$21.1$	$-689$	$-33^{\circ}46'$	$188^{\circ}32'$	$195^{\circ}19'$	$c^2$
$i$	$12.5$	$-130$	$-18^{\circ}0'$	$244^{\circ}31'$	$223^{\circ}38'$	$h$	$d$	$20.5$	$-668$	$-32^{\circ}55'$	$190^{\circ}55'$	$197^{\circ}42'$	$c^1$
$i^2$	$20.2$	$-93$	$-18^{\circ}59'$	$252^{\circ}10'$	$231^{\circ}17'$		$d^1$	$17.2$	$-229$	$-11^{\circ}0'$	$215^{\circ}20'$	$222^{\circ}7'$	$d$
							$e^1$	$13.8$	$-227$	$-12^{\circ}21'$	$218^{\circ}11'$	$224^{\circ}58'$	
							$e$	$17.5$	$+297$	$+17^{\circ}20'$	$229^{\circ}31'$	$236^{\circ}18'$	
							$e^2$	$14.7$	$+300$	$+16^{\circ}15'$	$231^{\circ}59'$	$238^{\circ}46'$	$e$
								$12.6$	$+304$	$+15^{\circ}36'$	$233^{\circ}47'$	$240^{\circ}34'$	$e^1$

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date	Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1861 April 7—Continued							April 10 0 <sup>h</sup> 11 <sup>m</sup>						
$f^1$	-13 <sup>s</sup> .7	-347 <sup>''</sup>	-18° 43'	214° 8'	220° 55'	$f^1$	$a$	-53 <sup>s</sup> .8	-405 <sup>''</sup>	- 2° 32'	164° 21'	213° 10'	$a$
$f$	11.4	-305	-17 28	217 34	224 21	$f$	$a^1$	53.1	-399	- 2 38	166 8	214 57	$a^1$
$f^2$	6.3	-263	-17 25	223 9	229 56	$f^2$	$a^2$	50.3	-412	- 4 50	170 18	219 7	$a^2$
$f^3$	4.1	-334	-22 10	222 37	229 24		$a^3$	48.1	-428	- 6 49	172 39	221 28	$a^3$
April 8 0 <sup>h</sup> 17 <sup>m</sup>							$b$	47.8	+ 31	+16 40	190 34	239 23	$b$
$a$	-40.1	-275	- 3 17	191 51	212 32	$a$	$b^1$	46.9	+ 47	+17 6	192 1	240 50	
$a^1$	37.8	-261	- 3 32	194 45	215 26	$a^1$	$b^2$	46.9	+ 35	+16 27	191 45	240 34	
$a^2$	34.7	-246	- 4 11	198 22	219 3		$c$	46.8	-517	-11 40	168 12	217 1	
$a^3$	30.9	-254	- 6 18	201 39	222 20	$a^3$	$d$	40.4	-566	-17 25	173 43	222 32	
$b$	37.8	-613	-21 6	175 10	195 51	$b$	$d^1$	40.0	-578	-18 12	173 16	222 5	
$b^1$	33.4	-587	-22 3	182 35	203 16		$e$	+24.8	- 16	-16 5	253 11	302 0	$d$
$c_1$	32.2	-784	-32 20	161 44	182 25	} $e$	$e^1$	27.8	+ 7	-15 54	256 27	305 16	
$c_2$	31.5	-780	-32 36	163 47	184 28		$e^2$	28.3	- 4	-16 42	256 42	305 31	$d^2?$
$c^1$	26.9	-223	-32 28	178 4	198 45		$f$	34.0	+568	+13 20	281 29	330 18	$e$
$c^2$	26.9	-745	-33 37	175 32	196 13		$f^1$	34.9	+557	+12 22	281 57	330 46	$e^1$
$d$	30.5	-345	-11 7	198 33	219 14	$c$	$f^2$	35.8	+555	+12 5	283 18	332 7	
$e$	29.7	+202	+17 27	215 26	236 7	$d$	April 11 0 <sup>h</sup> 41 <sup>m</sup>						
$e^1$	27.8	+193	+16 4	216 58	237 39	$f$	$a$	-56.0	-462	- 3 29	150 18	213 30	
$f$	23.5	-406	-17 26	202 22	223 3		$a^1$	53.9	-475	- 5 38	156 26	219 37	
$f^1$	23.5	-453	-19 54	200 14	220 55		$b$	55.6	- 60	+15 49	176 10	239 21	
$f^2$	17.7	-386	-18 57	208 22	229 3		$c$	13.2	-302	-16 20	212 18	275 29	
$g$	+44.6	+545	+ 8 40	296 12	316 53	$i^1$	$c^1$	11.3	-320	-18 6	213 15	276 26	
$h_1$	46.8	+616	+12 48	307 45	328 26	$k$	$d$	+12.1	-110	-16 17	238 43	301 54	
$h_2$	47.4	+606	+12 1	307 54	328 35	$k^1$	$d^1$	15.1	-108	-17 31	241 42	304 53	
April 9 0 <sup>h</sup> 15 <sup>m</sup>							$d^2$	16.6	- 83	-16 35	243 17	306 28	
$a$	-48.1	-351	- 3 1	178 2	212 54	$a$	$e$	23.8	+499	+12 51	266 42	329 53	$a$
$a^1$	46.1	-339	- 3 29	181 20	216 12		$e^1$	24.8	+493	+12 7	267 26	330 37	
$a^2$	43.8	-349	- 5 5	183 36	218 28	$a^2$	April 19 0 <sup>h</sup> 20 <sup>m</sup>						
$a^3$	40.8	-362	- 7 10	186 27	221 19	$a^3$	$a$	-60.6	-161	+12 56	155 18	330 33	
$b$	41.8	-674	-21 37	160 42	195 34		$b$	35.1	+147	+17 15	198 15	13 30	
$c$	39.7	-442	-11 41	183 40	218 32	$c$	$b^1$	33.4	+150	+16 39	199 59	15 14	
$c^1$	35.8	-408	-13 17	189 19	224 11		$b^2$	32.6	+177	+17 51	201 17	16 32	
$d$	38.2	+108	+16 9	204 8	239 0	$b$	$b^3$	31.3	+193	+18 10	202 55	18 10	
$e$	33.2	-811	-32 42	151 35	186 27		$b^4$	30.7	+232	+20 11	204 18	19 33	
$f$	33.2	-504	-17 56	187 16	222 8	$d$	$c^1$	+10.6	+518	+19 50	247 49	63 4	
$f^1$	32.8	-498	-17 49	188 1	222 53	$d^1$	$c^2$	12.6	+379	+10 57	244 35	59 50	
$g$	26.6	+276	+20 16	219 1	253 53		$c^3$	12.9	+455	+13 57	247 41	62 56	$b$
$g^1$	26.0	+276	+20 3	219 36	254 28		$c^4$	14.9	+424				
$g^2$	24.1	+279	+17 24	221 31	256 23		$c^5$	14.8	+491	+16 35	250 28	65 43	$b^3$
$h$	+36.9	+ 46	-17 4	267 28	302 20	$c$	$c^6$	16.3	+487	+15 47	251 36	66 51	
$i^1$	35.7	+507	+ 9 4	281 12	316 4		$c^7$	18.2	+419	+11 10	250 40	65 55	$b^5$
$i$	38.5	+522	+ 9 5	285 17	320 9		$d$	21.0	+487	+14 5	255 42	70 57	$b^6$
$k$	41.7	+600	+12 55	294 53	329 45	$f$	$d^1$	21.6	+484	+13 41	256 7	71 22	$c$
$k^1$	42.7	+589	+11 58	295 35	330 27	$f^1? f^2?$		29.8	+542	+14 23	266 57	82 12	$c^2$
								32.5	+546	+13 36	269 35	84 50	



Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date	Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1861 April 21 23 <sup>h</sup> 21 <sup>m</sup>													
$a^1$	-54.8	- 5"	+18° 1'	169° 28'	12° 12'	$a$	$a^3$	-33.9	+134"	+16° 5'	195° 7'	66° 33'	$a^1$
$a$	54.1	0	+17 58	170 35	13 19	$a$	$a^4$	31.7	+107	+13 37	196 36	68 2	$a^2$
$a^2$	53.6	+ 21	+18 53	171 51	14 35	$a$	$a^5$	28.9	+132	+13 50	199 44	71 10	$a^2$
$b^1$	14.7	+195	+11 13	215 25	58 9	$b^1$	$b$	25.3	-382	-15 8	187 39	59 5	$c$
$b^2$	11.7	+370	+20 11	222 27	65 11	$b^1$	$b^2$	22.7	-387	-16 30	189 49	61 15	$c^1$
$b^3$	12.3	+295	+14 32	220 25	63 9	$b$	$b^3$	20.8	-367	-16 13	192 15	63 41	$c^1$
$b^4$	10.0	+258	+16 54	224 16	67 0	$b^2$	$c$	18.6	-337	-15 30	195 12	66 38	$b$
$b^5$	8.4	+337	+13 14	226 1	68 45	$b^3$	$d$	19.0	+206	+13 54	210 5	81 31	$d$
$b^6$	4.9	+297	+14 5	228 17	71 1	$b^4$	$d^1$	+10.5	+596	+25 16	247 6	118 32	$d$
$c$	3.1	+325	+14 3	228 46	71 30	$b^5$	$d^2$	11.8	+568	+23 0	246 55	118 21	$d^2$
$c^1$	2.6	+328	+14 28	239 13	81 57	$d$	$e$	12.8	+592	+24 8	248 55	120 21	$d^2$
$c^2$	+ 7.6	+403	+10 37	237 58	80 42	$d$	$e^1$	16.9	+645	+25 55	255 29	126 55	$e^2 e^1$
$d$	8.4	+341	+15 6	242 56	85 40	$d$	$e^2$	19.7	+664	+26 7	259 16	130 42	$j$
$e$	29.4	+708	+25 8	275 10	117 54	$e$	$f$	20.9	+663	+25 36	260 23	131 49	$j^1$
$e^1$	36.0	+782	+28 38	297 20	140 4	$g$	$g$	24.1	+482	+13 18	254 16	125 42	$g$
$f$	42.9	+584	+13 0	283 20	126 4	$h$	$h$	26.1	+735	+28 32	271 38	143 4	$h_1 h_2$
$g$	48.2	+617	+14 0	298 17	141 1	$i$	$h^1$	35.9	+561	+14 3	270 15	141 41	$i$
$g^1$	48.9	+599	+12 37	297 30	140 14	$i^1$	$i^1$	36.5	+540	+12 22	269 31	140 57	$i^1$
$g^2$	49.8	+588	+11 46	298 34	141 18	$i^1$	$i$	55.0	+533	-18 5	277 32	148 58	$l$
							April 25 0 <sup>h</sup> 14 <sup>m</sup>						
April 22 0 <sup>h</sup> 10 <sup>m</sup>													
$a$	-60.7	- 76	+17 12	155 36	12 51	$a^2$	$a^1$	-54.9	- 63	+13 56	163 57	63 21	$a$
$b^1$	24.3	+247	+18 23	207 30	64 45	$a^2$	$a^2$	53.4	- 86	+16 11	167 25	66 49	$a^1$
$b^2$	25.4	+194	+14 11	205 50	63 5	$a$	$a^3$	50.3	- 25	+14 28	171 41	71 5	$a^1$
$b^3$	23.2	+154	+16 21	209 24	66 39	$a^3$	$b$	42.6	+ 30	+13 53	181 54	81 18	$b$
$b^4$	19.2	+201	+13 37	210 49	68 4	$a^4$	$c$	42.1	-538	-16 0	159 58	59 22	$c_1 c_2$
$b^5$	16.2	+226	+13 49	213 56	71 11	$a^5$	$c^1$	39.7	-512	-15 46	164 46	64 10	$c^1$
$c^1$	13.1	-293	-15 26	202 18	59 33	$b$	$d^1$	12.8	+421	+24 8	218 50	118 14	$d$
$c$	9.2	-265	-15 28	206 22	63 37	$b^3$	$d$	12.0	+438	+24 50	220 0	119 24	$d$
$c^2$	6.4	-240	-15 14	209 25	66 40	$c$	$d^2$	9.8	+440	+24 1	222 0	121 24	$d^1$
$d$	5.8	+304	+14 5	224 27	81 42	$d^2$	$e$	6.3	+493	+25 52	226 38	126 2	$e^1$
$d^1$	3.7	+301	+13 4	226 6	83 21	$d$	$e^1$	4.5	+498	+25 27	228 17	127 41	$e$
$e$	+20.6	+658	+25 13	260 48	118 3	$d^2$	$f$	0.9	+534	+26 13	232 38	132 2	$g$
$e^1$	23.0	+652	+23 54	262 52	120 7	$c$	$f^1$	+ 0.2	+534	+25 46	233 34	132 58	$f$
$f^1$	26.8	+703	+25 54	270 38	127 53	$g$	$g$	- 0.6	+318	+13 13	226 0	125 24	$f$
$j$	29.0	+705	+25 15	273 24	130 39	$h$	$h_1$	+ 8.9	+630	+28 26	245 19	144 43	$h_1$
$g$	32.1	+769	+28 45	285 2	142 17	$i$	$h_2$	9.7	+633	+28 18	246 12	145 36	$h_2$
$h$	34.5	+544	+13 17	268 41	125 56	$j$	$i$	15.4	+428	+13 36	242 33	141 57	$i_1$
$i$	43.3	+598	+14 0	284 24	141 39	$h^1$	$i^1$	15.9	+407	+12 2	242 14	141 38	$i^1$
$i^1$	43.9	+583	+12 51	283 47	141 2	$h^1$	$k$	30.5	+737	+27 30	275 29	174 53	$k$
							April 26 0 <sup>h</sup> 34 <sup>m</sup>						
$a^1$	35.2	+ 60	+14 15	191 44	63 10	$a$	$a^1$	-60.9	- 92	+14 53	150 23	64 1	$a$
$a^2$	36.1	- 63	+ 6 12	188 17	59 43		$a^2$		-133				
$a^2$	35.9	+162	+18 34	193 44	65 10		$a^3$						
							April 26 0 <sup>h</sup> 34 <sup>m</sup>						
$a^1$	35.2	+ 60	+14 15	191 44	63 10	$a$	$a^1$	-60.9	- 92	+14 53	150 23	64 1	$a$
$a^2$	36.1	- 63	+ 6 12	188 17	59 43		$a^2$		-133				
$a^2$	35.9	+162	+18 34	193 44	65 10		$a^3$						

Letter	<i>Aa</i>	<i>Aδ</i>	<i>b</i>	<i>L</i>	<i>L'</i>	Letter on next date
1861 April 26—Continued						
<i>a</i> <sup>i</sup>	−57.7	− 87"	+14° 34'	157° 50'	71° 28'	<i>b</i>
<i>b</i>	52.1	− 46	+14 6	167 45	81 23	<i>c</i>
<i>c</i> <sub>1</sub>	46.8	−594	−16 34	146 6	59 44	<i>c</i> <sup>i</sup>
<i>c</i> <sub>2</sub>	46.0	−603	−17 25	146 38	60 16	<i>d</i>
<i>c</i> <sup>i</sup>	44.6	−592	−17 37	150 30	64 8	<i>d</i> <sup>2</sup>
<i>d</i>	24.2	+350	+24 43	205 55	119 33	<i>e</i>
<i>d</i> <sup>i</sup>	21.7	+354	+23 53	208 14	121 52	<i>e</i>
<i>e</i> <sup>i</sup>	19.3	+411	+26 24	211 48	125 26	<i>e</i>
<i>e</i>	17.9	+413	+25 53	213 9	126 47	<i>e</i>
<i>f</i>	14.3	+232	+13 42	211 40	125 18	<i>e</i>
<i>f</i> <sup>i</sup>	9.6	+253	+13 2	216 2	129 40	<i>e</i>
<i>g</i>	12.0	+458	+26 12	219 32	133 10	<i>e</i>
<i>h</i> <sub>1</sub>	1.9	+559	+28 22	231 43	145 21	<i>e</i>
<i>h</i> <sub>2</sub>	1.0	+561	+28 9	232 32	146 10	<i>e</i>
<i>i</i> <sup>i</sup>	+ 2.5	+323	+12 27	227 34	141 12	<i>e</i>
<i>i</i> <sub>1</sub>	2.5	+353	+14 11	228 26	142 4	<i>e</i>
<i>i</i> <sub>2</sub>	3.5	+355	+13 55	229 18	142 56	<i>e</i>
<i>k</i>	23.0	+694	+27 26	261 39	175 17	<i>e</i>
<i>k</i> <sup>i</sup>	25.5	+709	+27 30	265 36	179 14	<i>e</i>
<i>l</i> <sup>i</sup>	35.5	+ 28	−15 22	248 27	162 5	<i>e</i>
<i>l</i>	38.1	+ 21	−16 38	250 57	164 35	<i>e</i>
<i>m</i>	42.8	+554	+12 7	275 40	189 18	<i>e</i>
<i>n</i>	48.3	+574	+11 57	286 57	200 35	<i>e</i>
<i>o</i> <sup>i</sup>	54.4	−110	−29 37	270 51	184 29	<i>e</i>
<i>o</i> <sup>2</sup>	55.3	− 83	−28 14	272 27	186 5	<i>e</i>
<i>o</i>	56.8	−154	−33 4	275 32	189 10	<i>e</i>
<i>p</i>	58.3	+ 18	−23 4	278 53	192 31	<i>e</i>
<i>p</i> <sup>i</sup>	59.2	+ 18	−23 18	280 47	194 25	<i>e</i>
<i>q</i>	58.3	+339	− 4 25	289 57	203 35	<i>e</i>
April 27 o <sup>h</sup> 26 <sup>m</sup>						
<i>a</i> <sup>n</sup> <sub>s</sub>	−64.0	−126	+14 53	138 15	65 50	<i>a</i>
<i>b</i>	59.0	−105	+14 7	153 56	81 31	<i>a</i>
<i>c</i>	48.7	−628	−17 10	134 5	61 40	<i>a</i>
<i>c</i> <sup>i</sup>	47.6	−630	−17 57	137 49	65 24	<i>a</i>
<i>d</i>	35.5	+268	+24 43	192 9	119 44	<i>a</i>
<i>d</i> <sup>i</sup>	34.5	+240	+22 35	192 39	120 14	<i>a</i>
<i>d</i> <sup>2</sup>	33.1	+272	+23 54	194 40	122 15	<i>a</i>
<i>e</i>	31.1	+326	+26 20	197 41	125 16	<i>a</i>
<i>f</i>	23.6	+381	+26 26	206 5	133 40	<i>a</i>
<i>g</i>	23.0	+160	+13 9	201 36	129 11	<i>a</i>
<i>h</i> <sub>1</sub>	13.0	+491	+28 48	218 38	146 13	<i>a</i>
<i>h</i> <sup>i</sup>	12.2	+482	+27 55	219 2	146 37	<i>a</i>
<i>h</i> <sup>2</sup>	12.1	+493	+28 34	219 27	147 2	<i>a</i>
<i>i</i> <sup>i</sup>	10.7	+238	+12 43	213 43	141 18	<i>a</i>
<i>i</i> <sub>1</sub>	10.6	+267	+14 20	214 31	142 6	<i>a</i>
<i>i</i> <sup>2</sup>	9.6	+269	+14 6	215 19	142 54	<i>a</i>
<i>k</i>	+13.7	+643	+27 44	248 18	175 53	<i>a</i>



Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1861 May 2—Continued						
$e^2$	-14.6	+171"	+10° 51'	203° 54'	201° 33'	$e$
$f_1$	12.3	-537	-29 15	184 21	182 0	
$f_2$	11.9	-519	-28 21	185 34	183 13	
$f^1$	10.5	-477	-26 27	188 37	186 16	$e^2$
$f^2$	8.7	-493	-28 7	189 32	187 11	
$f^3$	7.6	-389	-22 32	194 31	192 10	
$g$	5.7	-49	-4 29	205 45	203 24	$d$
$h^1$	0.9	-501	-31 48	196 5	193 44	
$h$	+0.4	-527	-33 57	196 12	193 51	
$h^2$	1.7	-503	-32 51	197 58	195 37	$g^1$
$h^3$	3.2	-519	-34 36	199 2	196 41	
$h^4$	6.8	-505	-35 15	202 56	200 35	
$i$	44.2	+526	+11 21	269 27	267 6	$g$
$k$	60.3	+323	-4 27	287 54	285 33	
May 4 0 <sup>h</sup> 24 <sup>m</sup>						
$a$	-58.3	+153	+27 56	152 32	178 20	$a$
$a^1$	57.2	+147	+27 0	154 45	180 33	
$b$	50.3	-44	+12 39	162 42	188 30	
$c$	43.3	+2	+12 23	171 54	197 42	$b$
$c^1$	39.1	+28	+12 11	176 52	202 40	
$d$	31.8	-225	-4 24	177 14	203 2	
$e$	30.4	-662	-29 0	156 49	182 37	$c$
$e^1$	29.0	-621	-7 15	161 41	187 29	
$e^2$	27.3	-645	-29 21	161 39	187 27	
$e^3$	24.7	-638	-30 5	165 0	190 48	$d$
$f$	29.1	-540	-22 37	166 47	192 35	
$f^1$	28.3	-539	-22 52	167 35	193 23	
$g^1$	20.4	-636	-31 50	169 29	195 17	$e$
$g$	19.2	-656	-33 35	169 20	195 8	
$g^2$	17.2	-642	-33 35	172 13	198 1	
$h$	+35.7	+16	-14 35	240 27	266 15	$g^1$
$h^1$	38.6	+48	-13 41	244 4	269 52	
$i$	36.1	+559	+16 12	259 3	284 51	
$i^1$	37.9	+579	+16 53	262 30	288 18	$h$
$k$	45.1	+270	-3 10	256 44	282 32	
$k^1$	48.5	+264	-4 30	260 50	286 38	
$l$	63.1	+170	-13 29	285 12	311 0	$i$
$l^1$	64.4	+161	-14 8	290 11	315 59	
May 5 1 <sup>h</sup> 10 <sup>m</sup>						
$a$	-62.4	+113	+27 25	141 52	183 9	$kk^1$
$b$	58.4	-109	+12 25	147 57	189 14	
$c$	53.0	-71	+12 12	157 25	198 42	
$c^1$	52.6	-106	+10 4	157 10	198 27	$a$
$d$	42.7	-306	-4 38	162 38	203 55	
$e$	37.3	-601	-22 41	152 37	193 54	
$e^1$	36.4	-599	-22 57	153 55	195 12	$b$

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$f$	-36.3	-704"	-28° 49'	143° 38'	184° 55'	$d$
$f^1$	34.7	-691	-28 51	147 40	188 57	
$g$	26.8	-706	-33 18	156 9	197 26	
$g^1$	24.5	-700	-33 57	159 16	200 33	$e$
$g^2$	22.2	-726	-36 36	159 21	200 38	
$h$	+22.2	-67	-14 39	225 10	266 27	
$h^1$	22.4	-48	-13 38	225 45	267 2	$e^1$
$h^2$	24.7	-48	-14 24	227 47	269 4	
$i$	28.8	+528	+16 52	248 32	289 49	
$k$	32.3	+196	-3 13	240 17	281 34	$h$
$k^1$	32.9	+202	-3 4	240 59	282 16	
$l^1$	57.5	+157	-12 46	270 10	311 27	
$l$	58.1	+145	-13 40	270 56	312 13	$h^1$
$l^2$	60.3	+141	-14 22	275 21	316 38	
$l^3$	61.5	+137	-14 50	278 4	319 21	
						$h^2$
May 7 1 <sup>h</sup> 47 <sup>m</sup>						
$a$	-64.2	-155	+12 18	129 58	198 41	$b$
$b$	56.4	-415	-5 2	134 18	203 1	
$c$	46.0	-678	-23 4	123 46	192 29	
$d$	35.9	-767	-32 54	132 16	200 59	$d$
$e$	7.3	-239	-13 59	194 49	263 32	
$e^1$	2.7	-222	-14 37	198 58	267 41	
$f$	3.8	-354	-21 43	194 21	263 4	$b$
$g$	+3.2	+25	-2 56	209 39	278 22	
$g^1$	9.5	+32	-4 37	214 48	283 31	
$h$	39.1	+46	-13 16	241 31	310 14	$d^1$
$h^1$	39.9	+39	-13 54	242 12	310 55	
$h^2$	44.4	+53	-14 29	247 27	316 10	
$i$	58.4	+148	-12 57	269 21	338 4	$d^2$
May 9 0 <sup>h</sup> 11 <sup>m</sup>						
$a^1$	-30.0	+98	+9 25	190 0	285 51	$a$
$a$	19.9	+109	+9 40	191 9	287 0	
$b$	18.5	-134	-4 14	186 39	282 30	
$c$	+14.7	-99	-13 19	214 19	310 10	$b_1$
$c^1$	16.0	-104	-14 1	215 19	311 10	
$c^2$	19.2	-88	-14 9	218 22	314 13	
						$b_2$
May 12 0 <sup>h</sup> 9 <sup>m</sup>						
$a$	-19.6	-572	-28 48	167 37	305 32	$a$
$b$	+52.5	+575	+15 7	281 47	59 42	
$b^1$	53.5	+554	+13 38	281 30	59 25	
$b^2$	53.5	+531	+12 7	277 22	55 17	$b^1$
May 14 2 <sup>h</sup> 19 <sup>m</sup>						
$a^1$	-39.1	-624	-25 9	139 2	306 58	$a$
$a^{\text{n}}$	38.1	-680	-29 6	136 54	304 50	
$a^{\text{s}}$	36.8	-693				

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date	Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1861 May 14—Continued													
$a^2$	-37 <sup>s</sup> .4	-626''	-25° 36'	142° 57'	310° 53'	$a^1$	$b$	-18 <sup>s</sup> .5	-117''	-3° 5'	174° 0'	106° 26'	
$a^3$	36.9	-617	-27 56	140 19	308 15		$c^1$	+3.4	+366	+18 57	201 32	133 58	$a$
$a^4$	36.2	-662	-28 42	140 21	308 17		$c$	15.7	+320	+12 50	210 40	143 6	
$b^1$	+41.3	+497	+13 45	251 17	59 13	$b^1?$	$c^2$	17.3	+346	+13 58	212 42	145 8	
$b_1$	42.7	+555	+16 53	256 40	64 36	$b_1$	$c^3$	18.7	+347	+13 20	214 57	147 23	
$b_2$	43.2	+537	+15 39	256 9	64 5	$b_2$	$c^4$	20.9	+347	+13 20	214 57	147 23	
$b_3$	44.0	+527	+14 49	256 36	64 32	$b_3$	$d$	22.8	+350	+12 42	217 44	150 10	$a^3$
May 15 0 <sup>h</sup> 10 <sup>m</sup>							$e$	25.0	+350	+12 42	217 44	150 10	
$a^1$	-43.0	-665	-25 51	128 55	308 57		$f$	34.8	+527	+20 14	235 59	168 25	$c$
$a$	41.1	-720	-29 47	123 39	303 41		$e$	41.3	+631	+25 8	251 26	183 52	
$b^1$	+34.2	+423	+11 38	239 4	59 6	$b^1?$	$f$	42.2	-106	-18 42	227 0	159 26	$b^1$
$b_1$	34.8	+500	+16 2	242 58	63 0	$b_1$	$f^1$	46.2	-96	-19 9	231 41	164 7	
$b^2$	35.2	+482	+14 50	242 36	62 38	$b_2$	$f^2$	47.7	-131	-21 42	233 14	165 40	$b^4$
$b_3$	36.0	+473	+14 5	243 3	63 5		$g$	63.0	+238	-3 37	265 9	197 35	$e$
May 19 0 <sup>h</sup> 16 <sup>m</sup>							May 25 1 <sup>h</sup> 18 <sup>m</sup>						
$a$	-33.5	+352	+29 9	172 6	48 20	$a$	$a$	-12.6	+178	+12 6	183 5	144 7	$a$
$a^1$	33.0	+354	+29 6	172 42	48 56		$a^1$	10.8	+178	+12 6	183 5	144 7	
$a^2$	28.7	+392	+30 7	177 34	53 48		$a^2$	9.0	+186	+11 51	185 27	146 29	
$b^1$	17.5	+157	+12 7	184 2	60 16		$a^3$	7.2	+210	+12 48	187 22	148 24	
$b_1$	15.3	+249	+16 51	187 36	63 50	$b_1$	$b$	3.6	+207	+11 21	191 14	152 16	$a^2$
$b_2$	15.0	+227	+15 27	187 29	63 43	$b_2$	$b$	2.0	+207	+11 21	191 14	152 16	
$b^2$	11.7	+273	+17 12	191 7	67 21	$b^1$	$b^1$	+10.8	-262	-19 12	193 24	154 26	$B$
$c$	+40.2	+119	-6 16	232 11	108 25	$c$	$b^1$	15.6	-249	-19 42	197 47	158 49	
$c^1$	47.1	+145	-6 36	240 22	116 36		$b^2$	18.5	-243	-20 7	200 25	161 27	
$d$	54.0	+485	+11 27	265 30	141 44	$d$	$b^3$	21.2	-306	-24 42	201 56	162 58	
$d^1$	56.3	+480	+10 40	271 12	147 26	$d^3$	$b^4$	21.8	-249	-21 22	203 16	164 18	
May 21 3 <sup>h</sup> 25 <sup>m</sup>							$b^5$	23.3	-312	-25 41	203 50	164 52	
$a$	-54.9	+228	+28 19	141 45	47 53		$c$	13.6	+407	+19 4	209 6	170 8	
$b_1$	42.1	+112	+16 53	158 11	64 19	$a_1$	$d$	48.3	+23	-11 58	233 33	194 35	$d$
$b$	42.1	+93	+15 45	157 57	64 5	$a_2$	$e$	48.8	+161	-4 6	236 36	197 38	
$b^1$	40.6	+124	+17 9	159 54	66 2	$b$	May 30 0 <sup>h</sup> 17 <sup>m</sup>						
$c$	+10.4	-5	-4 47	201 17	107 25	$c$	$a$	-65.2	-44	+12 24	112 38	143 15	$a$
$d$ <sup>n</sup>	37.6	+429	+12 14	236 57	143 5	$c$	$a^1$	61.5	-37	+11 52	121 19	151 56	
$d$ <sup>s</sup>	39.2	+412					$a^2$	61.0	-29	+12 12	122 23	153 0	$a^1$
$d^1$	39.6	+447	+13 28	239 26	145 34	$c^2$	$b$	49.4	-497	-17 54	122 55	153 32	$b$
$d^2$	40.4	+445	+13 9	240 16	146 24	$c^3$	$b^1$	49.0	-486	-17 20	124 22	154 59	
$d^3$	43.3	+438	+12 0	243 19	149 27	$c^4$	$b^2$	48.1	-509	-18 58	124 15	154 52	$b^1$
$d^4$	44.0	+433	+11 30	244 0	150 8		$b^3$	46.3	-495	-18 34	127 48	158 25	$b^2$
$e$	48.1	+580	+19 27	260 14	166 22	$d$	$c$	30.1	-35	+4 23	158 59	189 36	$c$
$f$	62.2	-47	-20 56	258 43	164 51	$f^2$	$c^1$	29.1	-19	+5 5	160 6	190 43	
May 23 0 <sup>h</sup> 23 <sup>m</sup>							$c^2$	27.1	-61	+2 11	161 11	191 48	
$a_1$	-59.6	+38	+17 39	131 57	64 23		$c^3$	26.5	-12	+4 24	163 0	193 37	$c^1$
$a_2$	59.6	+17	+16 24	131 47	64 13		$c^4$	25.8	-29	+3 44	162 51	193 28	$c^2$
							$d$	20.4	-150	-4 31	165 23	196 0	$d$
							$e$	+8.3	-509	-33 41	182 42	213 19	$f$
							$e^1$	8.8	-487	-32 19	183 27	214 4	$f^1$
							$f$	48.4	-154	-20 54	227 25	258 2	$h$
							$f^1$	49.1	-138	-20 5	228 21	258 58	
							$g$	52.2	+463	+14 39	248 20	278 57	$i$



Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date	Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1861 May 31 0 <sup>h</sup> 26 <sup>m</sup>							June 7 0 <sup>h</sup> 15 <sup>m</sup>						
a	-67.5	- 50''	+12° 20'	102° 54'	147° 38'		b <sup>2</sup>	-33.2	-356''	-14° 26'	143° 48'	260° 1'	a <sup>1</sup>
a <sup>1</sup>	66.3	- 40	+12 35	108 20	153 4		b <sup>3</sup>	31.4	-450	-20 27	142 32	258 45	c
b	54.5	-527	-18 43	108 17	153 1		c	29.8	-170	- 3 58	151 15	267 28	b
b <sup>1</sup>	53.5	-535	-19 28	110 1	154 45		c <sup>1</sup>	27.4	-171	- 4 29	153 21	269 34	
b <sup>2</sup>	52.4	-521	-18 54	114 26	159 10	a	c <sup>2</sup>	25.2	-180	- 5 26	155 9	271 22	
c	42.1	- 79	+ 4 32	145 40	190 24		c <sup>3</sup>	22.3	-147	- 4 4	158 17	274 30	b <sup>2</sup>
c <sup>1</sup>	40.0	- 67	+ 4 44	148 4	192 48		d	23.7	+150	+13 40	161 4	277 17	d
c <sup>2</sup>	39.3	- 96	+ 2 54	148 13	192 57		d <sup>1</sup>	19.4	+104	+10 4	164 18	280 31	d <sup>1</sup> d <sup>2</sup>
d	34.2	-204	- 4 31	151 0	195 44	b	e	14.7	+200	+14 51	169 28	285 41	d <sup>3</sup>
e	33.2	+221	+20 16	158 10	202 54		e <sup>1</sup>	13.8	+236	+16 52	170 38	286 51	
f	4.2	-554	-33 20	168 43	213 27		f <sup>s</sup>	6.3	+244	+16 0	177 35	293 48	e
f <sup>1</sup>	3.5	-529	-31 48	170 9	214 53	c	f <sup>n</sup>	5.4	+253				
g	+33.3	- 77	-12 25	210 46	255 30	d <sub>1</sub> d <sub>2</sub>	f <sup>1</sup>	3.2	+235	+14 39	179 36	295 49	e <sup>1</sup>
g <sup>1</sup>	37.2	- 85	-13 48	214 31	259 15	d <sup>1</sup>	f <sup>2</sup>	0.9	+333	+20 10	183 8	299 21	
g <sup>2</sup>	38.2	- 75	-13 26	215 38	260 22	d <sup>3</sup>	f <sup>3</sup>	+ 2.0	+316	+18 31	185 16	301 29	e <sup>2</sup>
h	37.2	-198	-20 38	213 33	258 17	d <sup>2</sup>	f <sup>4</sup>	3.4	+304	+17 30	186 12	302 25	
i	44.3	+429	+14 46	233 52	278 36	j	g	21.0	-425	-30 11	191 37	307 50	g <sub>1</sub> g <sub>2</sub>
i <sup>1</sup>	47.8	+446	+14 59	239 21	284 5		h <sup>1</sup>	22.2	-161	-13 45	195 11	311 24	f
k <sup>1</sup>	52.7	+542	+19 49	255 43	300 27	g <sup>1</sup>	h <sub>1</sub>	24.2	-198	-16 24	196 35	312 48	f <sup>1</sup>
k <sup>2</sup>	52.7	+508	+17 42	251 58	296 42	gg <sup>2</sup> g <sup>3</sup>	h <sub>2</sub>	25.1	-190	-16 6	197 29	313 42	f <sup>4</sup>
k	54.3	+479	+15 33	252 48	297 32	g <sup>2</sup>	June 7 0 <sup>h</sup> 15 <sup>m</sup>						
l	64.6	-252	-30 43	260 41	305 25	h	a	-56.3	-404	-13 15	110 33	253 25	
June 1 0 <sup>h</sup> 14 <sup>m</sup>							a <sup>1</sup>	52.4	-399	-13 56	117 29	260 21	
a	-55.9	-527	-18 45	102 24	161 3		b	52.3	-237	- 3 59	124 9	267 1	
b	46.0	-251	- 4 44	136 51	195 30		b <sup>1</sup>	50.2	-256	- 6 7	126 13	269 5	
c	15.6	-565	-31 8	156 48	215 27		b <sup>2</sup>	47.2	-223	- 4 5	130 49	273 41	
d <sub>1</sub>	+18.2	-145	-12 49	195 28	254 7	b	b <sup>3</sup>	46.1	-243	- 5 37	131 40	274 32	
d <sub>2</sub>	18.8	-147	-13 14	196 0	254 39		c	49.4	-500	-20 27	116 21	259 13	
d <sub>1</sub> <sup>1</sup>	22.8	-133	-13 8	199 39	258 18		d	48.2	+ 81	+14 6	133 54	276 46	a
d <sup>1</sup>	22.8	-133	-13 8	199 39	258 18		d <sup>1</sup>	46.1	+ 14	+ 9 41	135 56	278 48	
d <sup>2</sup>	24.4	-251	-20 40	199 45	258 24	b <sup>3</sup>	d <sup>2</sup>	45.2	+ 18	+ 9 46	136 53	279 45	
d <sup>3</sup>	25.7	-129	-13 32	202 14	260 53	b <sup>2</sup> ?	d <sup>3</sup>	43.4	+117	+15 23	139 33	282 25	
e <sub>1</sub>	33.9	+ 48	- 4 56	212 6	270 45		e <sup>n</sup>	32.0	+161	+15 33	151 29	94 21	b
e <sub>2</sub>	34.5	+ 46	- 5 12	212 41	271 20		e <sup>s</sup>		+150				
e <sup>1</sup>	36.8	+ 85	- 3 26	215 30	274 9	c <sup>2</sup>	e <sup>1</sup>	30.1	+152	+14 59	153 9	296 1	
e <sup>2</sup>	37.4	+ 53	- 5 25	215 31	274 10	c <sup>3</sup>	e <sup>2</sup>	24.9	+232	+18 53	158 40	301 32	
f	34.7	+378	+14 12	220 18	279 57	d	e <sup>3</sup>	24.4	+193	+16 24	158 48	301 40	
f <sup>1</sup>	39.9	+457	+17 50	228 51	287 30	e <sup>1</sup>	f <sub>1</sub>	7.5	-260	-13 37	167 10	310 2	d?
g <sub>1</sub>	47.3	+450	+15 45	237 51	296 30		f <sub>2</sub>	7.5	-268	-14 6	167 3	309 55	
g <sub>2</sub>	47.7	+456	+16 2	238 44	297 23	f	f <sub>3</sub>	6.8	-264	-13 56	167 37	310 29	
g <sub>3</sub>	48.2	+461	+16 14	239 40	298 19		f <sup>1</sup>	5.7	-296	-16 8	168 3	310 55	
g <sup>1</sup>	48.1	+518	+19 45	243 19	301 58	f <sup>2</sup>	f <sup>2</sup>	4.4	-282	-15 31	169 23	312 15	d <sup>1</sup>
g <sup>2</sup>	49.2	+439	+14 40	239 57	298 36	f <sup>1</sup>	f <sup>3</sup>	3.2	-264	-14 40	170 43	313 35	d <sup>2</sup>
h	60.9	-274	-30 53	248 27	307 6	g	f <sup>4</sup>	1.9	-273	-15 28	171 37	314 29	
June 5 2 <sup>h</sup> 41 <sup>m</sup>							g <sub>1</sub>	3.9	-513	-30 25	165 19	308 11	e
a	-55.4	+ 5	+11 20	125 59	242 12		g <sub>2</sub>	3.5	-513	-30 30	165 41	308 33	
b	39.7	-360	-13 15	136 58	253 11	a	June 9 23 <sup>h</sup> 11 <sup>m</sup>						
b <sup>1</sup>	38.6	-363	-13 39	138 2	254 15		a	-64.6	+ 59	+15 4	105 45	276 4	
							b	53.8	+ 99	+15 44	124 46	295 5	a

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date	Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date		
1861 June 9—Continued															
c	-44.4	+103"	+14° 23'	136° 20'	306° 39'	$b$ $b^1?$ $d$	$c_1$	-12.5	+219"	+16° 17'	158° 55'	82° 9'	$b_1 b_2$ $b^1$ $b^2?$ $c^1$ $c^2$		
d	35.8	-314	-11 51	139 5	309 24		$c_2$	12.0	+207	+15 29	159 16	82 30			
$d^1$	30.4	-344	-14 37	143 40	313 59		$c^1$	11.6	+163	+12 45	159 21	82 35			
$d^2$	28.8	-341	-14 43	145 16	315 35		$c^2$	8.3	+219	+15 46	162 35	85 49			
e	26.6	-572	-29 57	139 42	310 1		$c^3$	5.1	+207	+14 37	165 10	88 24			
$f_1$	+59.8	+431	+15 20	253 33	63 52	$e_1$ $e_2$	$c^4$	3.6	+193	+13 35	166 19	89 33	$c$ $c^3$		
$f_2$	60.4	+421	+14 36	254 32	64 51		$c^5$	2.9	+202	+14 1	167 2	90 16			
June 10 0 <sup>h</sup> 5 <sup>m</sup>															
a	-61.9	+ 74	+15 15	110 37	295 32	$a$ $b^1$ $d$	$c^6$	1.6	+214	+14 36	168 12	91 26	$c^4$ $c^5$ $e^1$ $e$ $e^2$ $e^3$ $e^4$ $e^5$		
b	47.7	-359	-12 50	123 40	308 35		$c^7$	+ 0.3	+226	+15 5	169 52	93 6			
$b^1$	42.1	-390	-15 37	129 18	314 13		$c^8$	4.5	+253	+16 12	173 46	97 0			
c	42.9	+140	+16 12	137 9	322 4		$c^9$	8.2	+290	+18 0	177 24	100 38			
$c^1$	39.2	+163	+17 0	141 11	326 6		d	6.3	-440	-26 30	168 52	92 6			
d	36.2	-607	-30 45	125 46	310 41		$d^1$	8.9	-412	-24 59	171 29	94 43			
$e_1$	+55.9	+396	+14 26	239 18	64 13		$d^2$	11.6	-437	-27 3	173 48	97 2			
$e_2$	56.4	+389	+13 55	239 43	64 38		$d^3$	12.6	-392	-24 10	174 57	98 11			
June 12 0 <sup>h</sup> 11 <sup>m</sup>															
a	-62.0	-354	-11 14	95 51	308 51		$a$ $c$ $d$ $f^1$ $f$	$d^4$	13.6	-414	-25 47	175 45		98 59	$e^4$ $e^5$  <



Letter	<i>Δa</i>	<i>Δδ</i>	b	L	L'	Letter on next date
1861 June 18—Continued						
<i>f</i> <sup>1</sup>	+ 3 <sup>s</sup> .3	— 70"	— 2° 51'	168° 32'	107° 42'	
<i>f</i>	6.2	— 51	+ 0 40	171 28	110 38	
<i>g</i> <sup>1</sup>	4.3	+ 342	+ 21 58	173 22	112 32	<i>e</i> <sup>1</sup>
<i>g</i> <sup>s</sup> <sub>n</sub>	6.5	+ 348	+ 22 54	176 31	115 41	<i>e</i>
<i>g</i> <sup>2</sup>	8.5	+ 378				
<i>g</i> <sup>3</sup>	9.0	+ 380	+ 23 46	178 11	117 21	
<i>g</i> <sup>4</sup>	9.7	+ 435	+ 27 16	179 42	118 52	<i>e</i> <sup>2</sup>
<i>h</i>	12.0	+ 376	+ 23 7	180 47	119 57	
<i>i</i>	17.2	— 111	— 7 0	179 47	118 57	
<i>i</i> <sup>1</sup>	22.1	+ 296	+ 16 47	188 34	127 44	} <i>F</i>
<i>i</i> <sup>2</sup>	23.6	+ 259	+ 14 20	189 18	128 28	
<i>i</i> <sup>3</sup>	24.8	+ 291	+ 16 8	190 56	130 6	
<i>k</i>	25.6	+ 289	+ 15 54	193 38	132 48	
<i>l</i>	35.0	— 153	— 11 50	195 39	134 49	
<i>l</i> <sup>1</sup>	35.8	+ 247	+ 11 59	200 36	139 46	<i>g</i>
<i>m</i> <sup>1</sup>	36.8	+ 223	+ 10 25	201 9	140 19	<i>g</i> <sup>1</sup>
<i>m</i> <sup>2</sup>	40.9	— 206	— 15 56	201 41	140 51	<i>h</i> <sup>1</sup>
<i>m</i> <sup>3</sup>	43.6	— 204	— 17 33	204 59	144 9	<i>i</i>
<i>m</i> <sup>4</sup>	47.9	— 243	— 19 18	209 58	149 8	
<i>m</i>	48.8	— 185	— 15 47	210 42	149 52	
<i>m</i> <sup>5</sup>	49.6	— 227	— 18 33	212 0	151 10	<i>k</i>
<i>n</i>	51.0	— 227	— 18 46	213 51	153 1	<i>k</i> <sup>1</sup>
	64.7	+ 146	+ 1 40	238 17	177 27	<i>l</i> <sup>1</sup> ? <i>l</i> <sup>3</sup>
June 20 0 <sup>h</sup> 24 <sup>m</sup>						
<i>a</i>	— 61.3	+ 120	+ 14 39	101 24	66 48	
<i>b</i> <sub>1</sub>	51.4	+ 162	+ 16 36	116 54	82 18	<i>a</i>
<i>b</i> <sub>2</sub>	50.6	+ 164				
<i>c</i>	45.3	+ 146	+ 15 5	123 58	89 22	
<i>c</i> <sup>1</sup>	40.9	+ 174	+ 16 25	128 45	94 9	
<i>d</i>	32.6	— 528	— 27 50	127 13	92 37	<i>d</i>
<i>d</i> <sup>1</sup>	32.1	— 494	— 25 33	129 0	94 24	
<i>d</i> <sup>2</sup>	30.2	— 451	— 22 51	132 19	97 43	
<i>d</i> <sup>3</sup>	28.8	— 501	— 26 21	132 18	97 42	
<i>d</i> <sup>4</sup>	28.1	— 521	— 27 47	132 25	97 49	
<i>d</i> <sup>5</sup>	27.4	— 496	— 26 9	133 55	99 19	
<i>d</i> <sup>6</sup>	24.9	— 492	— 26 8	136 39	102 3	
<i>e</i> <sup>1</sup>	21.1	+ 304	+ 22 39	148 13	113 37	
<i>e</i> <sup>s</sup> <sub>n</sub>	19.5	+ 309	+ 23 39	151 4	116 28	<i>e</i> <sub>1</sub> <i>e</i> <sub>2</sub>
<i>e</i> <sup>2</sup>	16.7	+ 340				
<i>e</i> <sup>3</sup>	14.7	+ 324	+ 23 16	154 12	119 36	
<i>e</i> <sup>4</sup>	13.8	+ 347	+ 24 38	155 10	120 34	
<i>e</i> <sup>5</sup>	12.7	+ 324	+ 23 3	156 2	121 26	
<i>f</i> <sub>1</sub>	8.7	+ 217	+ 15 55	159 0	124 24	
<i>f</i> <sub>2</sub>	8.0	+ 229	+ 16 34	159 43	125 7	
<i>f</i> <sup>1</sup>	3.1	+ 215	+ 15 11	163 46	129 10	
<i>f</i> <sup>2</sup>	0.4	+ 213	+ 14 47	166 3	131 27	
<i>g</i>	+ 9.9	+ 201	+ 12 55	174 38	140 2	<i>g</i>
<i>g</i> <sup>1</sup>	10.7	+ 160	+ 10 21	174 53	140 17	
June 22 0 <sup>h</sup> 15 <sup>m</sup>						
<i>a</i>	— 64.8	+ 167	+ 16 54	90 20	83 43'	
<i>b</i> <sup>1</sup>	58.2	+ 197	+ 18 35	103 39	97 2	
<i>b</i>	58.2	+ 174	+ 17 10	104 6	97 29	
<i>b</i> <sup>2</sup>	56.0	+ 186	+ 17 48	107 27	100 50	
<i>c</i>	52.7	+ 244	+ 21 15	111 22	104 45	<i>a</i>
<i>d</i>	51.0	— 522	— 26 38	99 58	93 21	
<i>d</i> <sup>1</sup>	50.6	— 502	— 24 45	102 48	96 11	
<i>d</i> <sup>2</sup>	46.1	— 440	— 21 18	112 43	106 6	<i>d</i>
<i>e</i> <sub>1</sub> <sup>s</sup> <sub>n</sub>	43.2	+ 283	+ 23 54	122 57	116 20	<i>b</i>
<i>e</i> <sub>2</sub>	41.5	+ 313	+ 24 54	124 44	118 7	<i>b</i> <sup>1</sup>
<i>e</i> <sup>1</sup>	39.6	+ 318	+ 25 5	126 53	120 16	<i>b</i> <sup>2</sup>
<i>f</i>	38.8	+ 174	+ 15 56	128 53	122 16	<i>c</i>
<i>f</i> <sup>1</sup>	36.5	+ 184	+ 16 23	131 14	124 37	
<i>f</i> <sup>2</sup>	31.4	+ 163	+ 14 41	136 19	129 42	
<i>f</i> <sup>3</sup>	28.6	+ 161	+ 14 20	138 58	132 21	<i>c</i> <sup>3</sup>
<i>g</i>	20.6	+ 150	+ 13 0	146 17	139 40	<i>c</i> <sup>4</sup>
<i>g</i> <sup>1</sup>	17.4	+ 179	+ 14 30	149 9	142 32	
<i>h</i> <sup>1</sup>	17.4	— 308	— 15 0	145 36	138 59	
<i>h</i> <sup>2</sup>	9.3	— 352	— 18 31	152 14	145 37	
<i>h</i>	3.8	— 336	— 18 0	157 11	150 34	<i>e</i>
<i>h</i> <sup>3</sup>	+ 0.4	— 384	— 21 30	160 21	153 44	
<i>i</i>	17.4	+ 209	+ 13 0	179 8	172 31	<i>f</i>
<i>i</i> <sup>1</sup>	22.5	+ 202	+ 12 3	183 35	176 58	<i>f</i> <sup>1</sup>
<i>k</i>	18.1	+ 51	+ 3 26	178 16	171 39	<i>g</i>
<i>k</i> <sup>1</sup>	20.4	+ 53	+ 3 20	180 12	173 35	<i>g</i> <sup>1</sup> ?
<i>k</i> <sup>2</sup>	22.5	+ 44	+ 2 34	182 0	175 23	
<i>k</i> <sup>3</sup>	23.4	+ 81	+ 4 42	183 6	176 29	<i>g</i> <sup>1</sup> ?
<i>k</i> <sup>4</sup>	25.7	+ 68	+ 3 40	185 0	178 23	
<i>l</i>	42.3	— 216	— 15 23	199 58	193 21	
June 24 23 <sup>h</sup> 52 <sup>m</sup>						
<i>a</i>	— 64.5	+ 254	+ 21 28	84 23	105 36	
<i>b</i> <sup>s</sup> <sub>n</sub>	59.2	+ 282	+ 24 10	96 26	117 39	<i>b</i>
<i>b</i> <sup>1</sup>	58.4	+ 313	+ 25 15	97 19	118 32	
<i>b</i> <sup>2</sup>	56.9	+ 320	+ 25 40	99 58	121 11	

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date	Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1861 June 24—Continued													
$c^s$	-59.3	+164"	+16° 30'	100° 12'	121° 25'	$a$	$e^1$	+10.9	-262"	-13° 55'	166° 14'	229° 8'	$b^1$
$c^1$	55.4	+183	+15 38	106 38	127 51		$e^s$	12.8	-264	-13 48	168 18	231 12	$b$
$c^2$	55.4	+183	+17 0	106 18	127 31		$e^2$	13.8	-250	-16 3	172 55	235 49	
$c^3$	52.3	+148	+14 43	111 10	132 23	$a^2$	$e^3$	18.6	-287	-15 38	176 18	239 12	$b^3$
$c^4$	47.1	+113	+12 27	117 53	139 6	$a^3$	$f$	22.3	-276	-9 43	207 20	270 14	$c$
$d$	57.3	-460	-22 59	89 16	110 29		$f^1$	52.4	-137	-8 57	209 48	272 42	
$e$	31.8	-372	-18 8	129 31	150 44	$c$	June 29 0 <sup>h</sup> 12 <sup>m</sup>						
$f$	16.1	+143	+12 13	148 6	169 19	$d$	$a$	-63.5	+ 2	+ 4 15	88 53	180 28	
$f^1$	7.6	+153	+12 11	155 25	176 38	$f$	$b^1$	21.0	-276	-13 2	137 0	228 35	
$g$	11.5	+ 14	+ 4 7	151 28	172 41	$e$	$b^s$	19.4	-279	-13 44	138 59	230 34	$a$
$g^1$	7.6	+ 18	+ 4 4	154 45	175 58	$e^1$	$b^2$	18.0	-295	-15 12	145 21	236 56	
$h^s$	+52.9	-171	-13 50	210 55	232 8	$h$	$b^3$	11.3	-305	-16 7	148 0	239 35	
$i$	57.2	-194	-15 7	217 19	238 32	$i$	$c$	8.2	-317	-8 57	177 27	269 2	$c$
June 25 3 <sup>h</sup> 28 <sup>m</sup>							$c^1$	+25.6	-173	-9 38	185 53	277 28	
$a^1$	-66.4	+139	+13 51	82 53	120 15		$d$	34.5	-174	+19 33	225 16	316 51	$e$
$a^s$	65.5	+176	+16 9	84 20	121 42		$d^1$	59.3	+348	+19 36	231 34	323 9	$e^2$
$a^2$	61.6	+155	+13 35	95 22	132 44		$e$	61.4	+355	+2 53	228 29	320 4	$f^1$
$a^3$	58.5	+132	+12 9	101 16	138 38		$e^1$	65.3	+ 84	+ 2 7	232 38	324 13	$f$
$b^s$	63.7	+109	+24 17	81 40	119 2		$f^s$	66.7	+ 76	-12 42	233 52	325 27	$g$
$c$	45.6	+293	-18 20	112 58	150 20	$a$	July 1 0 <sup>h</sup> 36 <sup>m</sup>						
$d$	34.2	+321	+11 32	130 21	167 43	$b$	$a^s$	-46.5	-274	-13 20	110 10	230 3	$a$
$e$	30.0	-382	+3 10	134 4	171 26	$c$	$b$	45.3	-289	+ 7 57	135 41	255 34	$c$
$e^1$	23.7	-21	+ 3 7	139 48	177 10		$c$	22.0	+ 70	- 8 19	150 16	270 9	
$f$	25.4	+137	+12 27	138 38	176 0		$d$	4.2	-192	+14 29	177 0	296 53	
$g$	+28.1	-495	-31 20	184 44	222 6	$d$	$e$	+25.3	+205	+20 20	197 35	317 28	$e$
$g^1$	31.2	-484	-30 52	187 58	225 20	$e$	$e^1$	43.5	+319	+18 21	198 56	318 49	
$h^s$	39.4	-225	-13 52	194 10	231 32		$e^2$	45.2	+289	+19 50	203 37	323 30	$e^3$
$h^1$	41.2	-206	-15 11	196 13	233 35		$e^3$	48.3	+317	+19 15	205 34	325 27	$e^4$
$i^1$	44.8	-233	-15 0	200 11	237 33	$e^3$	$e^4$	49.9	+310	+20 13	211 7	331 0	$e^7$
$i$	45.9	-224	-15 26	201 26	238 48		$f^1$	53.2	+331	+ 4 4	197 59	317 52	$f$
$i^2$	47.2	-229	-17 3	203 16	240 38		$f$	47.4	+ 56	+ 2 7	203 40	323 33	
$k$	66.0	-252	-9 51	233 19	270 41	$f$	$g^s$	52.3	+ 30	-12 22	205 6	324 59	$g$
June 27 23 <sup>h</sup> 8 <sup>m</sup>							$g^1$	52.0	-217	-12 16	216 42	336 35	$g^2$
$a$	-59.6	-360	-17 23	89 28	152 22		July 3 0 <sup>h</sup> 5 <sup>m</sup>						
$b$	55.0	+107	+11 27	104 46	167 40		$a$	-62.6	-258	-13 19	82 3	229 42	
$c$	53.5	- 35	+ 2 51	107 10	170 4		$b$	56.0	+279	+20 1	93 14	240 53	
$c^1$	49.4	+ 2	+ 5 0	112 24	175 18		$b^1$	53.2	+281	+20 18	97 40	245 19	
$c^2$	45.9	0	+ 4 48	116 27	179 21		$c$	49.9	+ 67	+ 7 23	105 36	253 15	$a$
$c^3$	44.0	0	+ 4 45	118 35	181 29		$d$	36.3	+144	+12 18	120 2	267 41	$b$
$c^4$	43.5	- 9	+ 4 12	119 6	182 0		$d^1$	33.0	+160	+13 19	123 12	270 51	
$d$	+ 4.2	-521	-30 40	159 27	222 21	$a^?$	$d^2$	31.9	+132	+11 48	123 59	271 38	



Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1861 July 3—Continued						
$d^3$	-31.5	+142"	+12° 13'	124° 48'	272° 27'	$b^1$
$e^1$	+12.4	+251	+18 20	163 39	311 18	
$e$	19.0	+291	+20 37	169 59	317 38	$e$
$e^2$	22.9	+333	+23 4	174 7	321 46	
$e^3$	25.5	+291	+20 21	176 4	323 43	$e^2$
$e^4$	26.9	+284	+19 51	177 21	325 0	$e^3$
$e^5$	27.4	+290	+20 10	177 56	325 35	$e^4$
$e^6$	31.9	+283	+19 33	182 16	329 55	
$e^7$	32.9	+288	+19 49	183 21	331 0	$e^7$
$j$	26.2	- 8	+ 2 7	174 43	322 22	$j$
$g^1$	26.8	-237	-11 51	175 23	323 2	$g^1$
$g^s$	28.1	-256	-12 12	177 21	325 0	$g$
$g^n$	29.7	-226	-12 12	177 21	325 0	$g$
$g^2$	40.3	-231	-12 10	188 39	336 18	$g^2$
July 5 0 <sup>h</sup> 39 <sup>m</sup>						
$a$	-65.7	+ 81	+ 6 21	76 14	252 17	
$b$	58.4	+146	+11 4	90 37	266 40	
$b^1$	54.3	+150	+11 36	96 51	272 54	
$c$	45.6	-320	-16 46	106 31	282 34	$a$
$c^1$	43.4	-321	-16 44	109 1	285 4	$a^1$
$d$	13.3	+ 9	+ 4 9	139 18	315 21	$b$
$e$	10.3	+266	+19 50	141 55	317 58	
	9.4					
$e^1$	7.3	+243	+18 28	144 14	320 17	$b^1$
$e^2$	2.8	+263	+19 38	148 8	324 11	$b^3$
$e^3$	1.8	+263	+19 38	149 1	325 4	
$e^4$	1.2	+279	+20 38	149 36	325 39	
$e^5$	+ 0.8	+259	+19 21	151 19	327 22	
$e^6$	4.9	+281	+20 41	154 59	331 2	$b^4$
$e^7$	4.9	+254	+19 0	154 55	330 58	$b^5?$
$e^8$	5.8	+266	+19 44	155 45	331 48	
$j$	- 6.2	- 39	+ 1 16	145 19	321 22	
$g^1$	5.7	-245	-11 18	145 33	321 36	
$g^n$	3.4	-245	-12 26	148 17	324 20	$c$
$g^s$	1.5	-281	-12 26	148 17	324 20	
$g^2$	+11.8	-268	-12 53	160 24	336 27	
July 7 0 <sup>h</sup> 27 <sup>m</sup>						
$a$	-62.7	-272	-15 54	76 57	280 57	
$a^1$	60.5	-268	-15 15	82 51	286 51	
$b$	36.0	+281	+20 23	122 4	326 4	$b$
$b^1$	33.4	+246	+18 2	117 41	321 41	
$b^2$	30.1	+315	+22 28	120 6	324 6	
$b^3$	29.7	+285	+20 36	120 55	324 55	$b^1$
$b^4$	24.0	+257	+19 2	126 46	330 46	
$b^5$	22.6	+285	+20 59	127 57	331 57	
Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$c^n$	-32.7	-230''	-11° 25'	120° 29'	32° 429'	$c$
$c^s$	31.0	-248				
$d$	+61.0	-289	-15 55	216 36	60 36	$f?j^1$
$e$	61.0	-131	- 5 51	212 4	56 4	$e$
$j$	62.1	+273	+18 19	220 42	64 42	$g$
$g$	63.3	+319	+20 46	228 26	72 26	$i$
July 9 23 <sup>h</sup> 58 <sup>m</sup>						
$a$	-56.8	+ 56	+ 4 30	90 24	322 20	
$b$	54.4	+317	+20 20	87 52	319 48	
$b^1$	50.9	+303	+19 58	93 46	325 42	
$c^n$	54.9	-200	-11 27	92 59	324 55	$c$
$c^s$	54.2	-218				
$d$		+102				
$e$	+39.9	-160	- 5 39	182 44	54 40	$c^1$
$f$	43.9	-319	-15 45	189 1	60 57	
$f^1$	44.5	-317	-15 38	189 42	61 38	
$g^n$	47.1	+257	+18 56	193 53	65 49	$d$
$g^s$	48.5	+243				
$h$	50.2	-335	-17 5	197 28	69 24	$e$
$i^1$	52.1	+275	+20 17	200 3	71 59	$d^1$
$i$	53.6	+292	+21 15	202 53	74 49	$d^2 d^3$
$k$	58.6	+181	+14 5	208 1	79 57	$j$
$k^1$	60.0	+218	+16 10	211 42	83 38	$j^1$
$l$	62.5	-346	-19 16	224 20	96 16	$g^1$
July 11 3 <sup>h</sup> 13 <sup>m</sup>						
$a^n$	-66.5	-143	-10 43	64 56	326 42	
$a^s$		-160				
$b$	41.4	+166	+11 55	106 1	7 47	
$b^1$	38.9	+164	+12 0	108 42	10 28	
$c$	+ 7.9	-136	- 3 46	151 37	53 23	
$c^1$	11.1	-160	- 5 9	154 25	56 11	
$c^2$	13.7	-178	- 6 12	156 42	58 28	
$d^n$	21.3	+245	+18 45	164 6	65 52	$b$
$d^s$	23.2	+217				
$d^1$	28.6	+250	+20 0	170 19	72 5	
$d^2$	30.3	+254	+20 14	172 2	73 48	$c$
$d^3$	31.4	+254	+19 32	173 3	74 49	
$e^s$	23.2	-360	-17 11	166 22	68 8	$a$
$e^n$		-351				
$e^1$	25.2	-390	-19 25	168 42	70 28	
$f$	37.3	+150	+13 50	178 19	80 5	
$f^1$	40.2	+173	+15 12	181 34	83 20	
$g$	44.7	-428	-22 12	191 2	92 48	$d^2$
$g^1$	46.9	-310	-21 4	193 24	95 10	$d$
$g^2$	52.1	-427	-22 32	202 13	103 59	
$h^n$	59.5	+392	+25 53	216 35	118 21	$e$
$h^s$		+367				

Letter	$\Delta\alpha$	$\Delta\delta$	$\delta$	L	L'	Letter on next date
1861 July 17 3 <sup>h</sup> 59 <sup>m</sup>						
<i>a</i>	-57 <sup>s</sup> .2	-214''	-16° 33'	80° 35'	66° 59'	
<i>b</i>	52.6	+342	+19 28	80 39	67 3	<i>a</i>
<i>c</i> <sup>1</sup>	46.7	+317	+18 58	89 58	76 22	
<i>c</i>	46.0	+345	+20 47	90 0	76 24	<i>b</i>
<i>c</i> <sup>2</sup>	43.4	+321	+19 42	93 58	80 22	
<i>d</i> <sup>1</sup>	36.5	-417	-24 56	105 44	92 8	
<i>d</i> <sup>2</sup>	35.5	-372	-21 42	107 27	93 51	<i>c</i> <sup>1</sup>
<i>d</i>	34.6	-338	-19 17	109 4	95 28	<i>c</i>
<i>d</i> <sup>3</sup>	33.8					
<i>d</i> <sup>3</sup>	32.8	-347	-19 42	110 28	96 52	<i>c</i> <sup>2</sup>
<i>d</i> <sup>4</sup>	31.9	-319	-17 46	111 33	97 57	
<i>e</i> <sub>1</sub>	1.1	+376	+27 55	135 38	122 2	<i>d</i>
<i>e</i> <sub>2</sub>	0.4	+376	+27 58	136 21	122 45	
<i>e</i> <sub>3</sub>	0.4	+358	+26 44	136 29	122 53	
<i>f</i>	+8.1	-350	-16 7	147 56	134 20	<i>d</i> <sup>1</sup>
<i>f</i> <sup>1</sup>	11.1	-354	-15 40	150 19	136 43	
<i>g</i>	60.8	-192	-5 9	204 45	191 9	<i>j</i>
July 19 0 <sup>h</sup> 25 <sup>m</sup>						
<i>a</i>	-60.3	+407	+20 24	54 52	67 16	
<i>b</i>	57.7	+412	+21 41	63 46	76 10	
<i>c</i>	53.9	-266	-18 6	83 54	96 18	<i>a</i>
<i>c</i> <sup>1</sup>	53.9	-307	-20 50	83 1	95 25	
<i>c</i> <sup>2</sup>	52.8	-277	-18 32	85 26	97 50	
<i>c</i> <sup>3</sup>	52.8	-353	-23 45	83 36	96 0	
<i>d</i>	23.9	+430	+28 52	110 20	122 44	<i>b</i> <sup>1</sup>
<i>d</i> <sup>1</sup>	23.9	+412	+27 42	110 47	123 11	<i>b</i>
<i>e</i>	+43.2	-199	-4 32	178 7	190 31	<i>c</i>
<i>j</i>	61.6	-307	-11 54	210 30	222 54	<i>d</i>
July 21 0 <sup>h</sup> 45 <sup>m</sup>						
<i>a</i>	-64.7	-197	-17 22	59 1	99 41	
<i>b</i>	43.8	+477	+28 9	82 37	123 17	<i>b</i> <sup>1</sup>
<i>b</i> <sup>1</sup>	43.2	+492	+29 14	82 31	123 11	<i>b</i>
<i>b</i> <sup>2</sup>	42.6	+500	+29 51	82 59	123 39	
<i>c</i>	+15.7	-175	-3 59	149 50	190 30	<i>d</i>
<i>d</i>	46.6	-326	-11 38	182 52	223 32	<i>j</i>
<i>e</i> <sub>n</sub>	58.6	+365	+30 3	205 51	246 31	<i>g</i>
<i>e</i> <sub>s</sub>		+347				
<i>e</i> <sup>1</sup>	59.1	+346	+29 22	206 41	247 21	<i>g</i> <sup>1</sup>
<i>e</i> <sup>2</sup>	61.0	+347	+29 7	213 0	253 40	<i>g</i> <sup>2</sup>
	61.7	+347	+28 55	216 12	256 52	<i>g</i> <sup>3</sup> <i>g</i> <sup>4</sup>
<i>e</i> <sup>3</sup>	62.4	+354	+28 11	216 2	256 42	<i>g</i> <sup>8</sup>
<i>j</i>	63.7	+328				
	63.7	+246	+22 37	214 3	254 43	<i>g</i> <sup>6</sup>
Letter	$\Delta\alpha$	$\Delta\delta$	$\delta$	L	L'	Letter on next date
1861 July 23 1 <sup>h</sup> 10 <sup>m</sup>						
<i>a</i>	-58 <sup>s</sup> .1	-9''	-5° 9'	74° 44'	143° 42'	
<i>b</i> <sup>1</sup>	54.1	+515	+26 57	57 2	126 0	
<i>b</i>	53.4	+528	+27 55	57 6	126 4	
<i>c</i> <sup>1</sup>	43.4	+204	+11 16	90 40	159 38	<i>a</i>
<i>c</i> <sup>2</sup>	42.0	+202	+11 22	92 14	161 12	
<i>c</i>	38.2	+190	+11 22	96 37	165 35	<i>a</i> <sup>1</sup>
<i>d</i>	15.4	-136	-4 40	121 22	190 20	
<i>e</i>	+21.1	-75	+2 54	151 56	220 54	
<i>f</i>	21.9	-322	-12 5	155 15	224 13	<i>b</i>
<i>g</i> <sub>n</sub>	42.8	+338				
<i>g</i> <sub>s</sub>	44.1	+310	+28 54	175 56	244 54	<i>c</i>
<i>g</i> <sup>1</sup>	45.2	+326	+29 6	178 22	247 20	
<i>g</i> <sup>2</sup>	49.0	+324	+29 6	183 50	252 48	<i>dot</i>
<i>g</i> <sup>3</sup>	49.9	+296	+27 18	184 25	253 23	
<i>g</i> <sup>4</sup>	50.6	+296	+27 19	185 31	254 29	<i>c</i> <sup>2</sup>
<i>g</i> <sup>5</sup>	50.6	+187	+20 30	183 15	252 13	<i>c</i> <sup>1</sup>
<i>g</i> <sup>6</sup>	51.6	+230	+23 11	185 26	254 24	
<i>g</i> <sup>7</sup>	54.7	+223	+22 46	190 13	259 11	<i>c</i> <sup>3</sup>
<i>g</i> <sup>8</sup>	55.6	+312	+28 18	194 49	263 47	<i>c</i> <sup>4</sup>
<i>h</i>	48.1	-371	-13 45	184 27	253 25	<i>dot</i>
<i>i</i>	59.0	-39	+6 49	194 44	263 42	<i>e</i>
<i>k</i>	59.7	-378	-14 49	207 31	276 29	<i>j</i>
July 25 23 <sup>h</sup> 38 <sup>m</sup>						
<i>a</i>	-59.1	+304	+12 47	61 37	157 45	
<i>a</i> <sup>1</sup>	55.7	+271	+11 55	69 57	166 5	
<i>b</i>	6.6	-272	-11 48	128 14	224 22	<i>a</i>
<i>c</i> <sub>n</sub>	+21.1	+356				
<i>c</i> <sub>s</sub>	22.3	+343	+29 26	149 13	245 21	<i>c</i>
<i>dot</i>	27.8	+329	+28 41	155 31	251 39	<i>c</i> <sup>4</sup>
<i>c</i> <sup>1</sup> <sub>n</sub>	28.8	+202	+20 14	156 10	252 18	<i>c</i> <sup>3</sup>
<i>c</i> <sup>2</sup>	31.5	+297	+26 58	159 19	255 27	<i>c</i> <sup>5</sup>
<i>c</i> <sup>3</sup>	36.3	+238	+23 37	164 15	260 23	<i>c</i> <sup>8</sup>
<i>dot</i>	37.4	+313	+28 28	166 9	262 17	
<i>c</i> <sup>4</sup>	40.2	+299	+27 46	169 21	265 29	<i>c</i> <sup>9</sup>
<i>d</i>	21.3	-334	-12 26	153 19	249 27	<i>d</i>
<i>dot</i>	22.4	-324	-11 43	154 10	250 18	
<i>dot</i>	23.3	-327	-11 51	155 4	251 12	
<i>dot</i>	26.4	-363	-13 49	158 36	254 44	
<i>d</i> <sup>1</sup>	27.3	-363	-13 44	159 29	255 37	
<i>e</i>	38.9	-44	+6 38	167 1	263 9	
<i>j</i>	46.5	-399	-14 53	181 44	277 52	<i>d</i> <sup>3</sup>
July 27 0 <sup>h</sup> 15 <sup>m</sup>						
<i>a</i>	-35.3	-195	-11 47	99 48	224 22	
<i>b</i>	12.2	-262	-11 55	121 38	246 12	



1861 July 27—Continued

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$c^1$	- 6 <sup>s</sup> .5	+382''	+27° 51'	119° 6'	243° 40'	
$c^2$	4.6	+403	+29 14	121 33	246 7	$c$
$c^3$	2.8	+390	+29 11	124 42	249 16	
$c^4$	0.6	+388	+19 35	127 46	252 20	$b$
$c^5$	+ 0.7	+232	+22 4	127 25	251 59	
$c^6$	0.8	+272	+29 16	127 43	252 17	
$c^7$	2.5	+382	+27 34	130 48	255 22	$c^{1?}$
$c^8$	5.4	+349	+26 13	131 1	255 35	$c^{2?}$
$c^9$	5.4	+328	+27 58	136 5	260 39	
$d$	6.4	+353	+22 45	142 11	266 45	$a$
$d^1$	10.2	+262	+10 53	143 44	268 18	$a^{1?}$
$d^2$	16.1	-312	-11 12	146 35	271 9	$d$
$d^3$	18.6	-321	-14 58	153 37	278 11	$h$
$e$	22.5	-383	-10 7	195 38	320 12	
$e^1$	56.8	-347				
$e^2$	57.9	-329				

August 1 0<sup>h</sup> 28<sup>m</sup>

$a$	-54.4	-104	-10 3	72 33	267 25	
$a^1$	51.1	-116	-11 38	76 53	271 45	
$b$	52.7	+432	+19 23	58 29	253 21	
$c$	48.5	+562	+28 43	55 18	250 10	
$c^1$	47.4	+576	+26 6	62 10	257 2	
$c^2$	47.0	+517	+27 57	62 5	256 57	
$c^3$	45.8	+542	+29 54	65 2	259 54	
$d$	43.1	+560	-15 3	84 18	279 10	$b$
$e$	45.4	-196	-15 7	93 54	288 46	$c$
$e^1$	37.0	-231	-16 2	96 23	291 15	
$e^2$	34.7	-254	-16 40	96 59	291 51	$d$
$j$	34.1	-266	+10 28	103 3	297 55	
$j^1$	22.7	+148	+11 8	104 18	299 10	
$g$	21.2	+154	-10 22	109 0	303 52	$e$
$g^1$	21.1	-210	-9 24	110 48	305 40	
$g^2$	19.0	-201	-4 32	120 19	315 11	$j^1$
$h$	16.6	-231	-9 54	125 27	320 19	$j$
$h^1$	7.4	-156	-13 35	146 58	341 50	
$h^2$	3.7	-267	-16 17	151 39	346 31	
$i$	1.8	-249	-14 3	151 7	345 59	$g^1$
$i^1$	+19.9	-375	-4 22	165 45	0 37	
$i^2$	23.7	-425	+11 25	173 13	8 5	$h$
$k$	24.0	-391	+15 57	174 49	9 41	
$l$	40.9	-266	+15 29	180 12	15 4	
$l^1$	49.8	-16	+16 14	181 9	16 1	
$l^2$	51.1	+ 58				
$l^3$	54.7	+ 47				
$l^4$	55.3	+ 59				

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$m$	+58 <sup>s</sup> .0	+116''	+19° 45'	186° 20'	21° 12'	$h^2$
$m^1$	61.4	+115	+19 37	193 29	28 21	$h^3$
$m^2$	62.3	+148	+21 32	196 46	31 38	$h^4$
$n$	58.8	-191	+ 1 10	189 15	24 7	$i$

August 3 0<sup>h</sup> 13<sup>m</sup>

$a$	-62.2	+ 49	- 6 6	54 25	277 12	
$b$	61.6	-102	-14 55	56 50	279 37	
$c$	58.5	-123	-15 1	63 13	286 0	
$d$	54.6	-178	-17 7	69 49	292 36	$a$
$e$	46.9	-104	-10 13	80 15	303 2	$b$
$f$	35.1	- 88	- 6 16	92 54	315 41	$c^1 c^2$
$f^1$	31.9	-174	- 9 55	97 33	320 20	$c$
$f^2$	30.3	-155	- 4 55	96 42	319 29	$c^3$
$f^3$	31.1	- 81	- 9 22	101 4	323 51	$c^5$
$g$	27.5	-169	-10 31	116 31	339 18	
$g^1$	11.0	-245	-14 13	121 51	344 38	
$g^2$	5.9	-321	-15 26	125 20	348 7	
$h$	2.4	-351	+15 36	144 9	6 56	
$h^1$	+25.3	+ 91	+17 28	150 24	13 11	
$h^2$	31.7	+107	+18 22	157 50	20 37	
$h^3$	38.7	+107	+19 40	165 58	28 45	
$h^4$	45.6	+116	+21 9	166 59	29 46	$f$
$i$	46.4	+139	+ 1 19	160 5	22 52	$e$
$i^1$	38.6	-178	+ 1 4	161 58	24 45	$e^1$
$k$	40.3	-185	- 6 40	175 16	38 3	$g$
$k^1$	48.8	-324				

August 4 2<sup>h</sup> 33<sup>m</sup>

$a$	-61.7	-126	-16 55	55 5	293 16	
$b$	56.9	- 48	-10 13	64 47	302 58	
$c$	48.1	- 39	- 6 55	77 12	315 23	
$c^1$	47.7	- 26	- 6 3	77 32	315 43	
$c^2$	45.1	- 95	- 9 53	82 8	320 19	
$c^3$	43.8	-116	- 4 27	81 12	319 23	
$c^4$	44.4	- 53	- 6 44	81 39	319 50	
$c^5$	44.4	-110	- 9 8	86 23	324 34	
$d$	40.7	-110	-16 45	119 24	357 35	
$d^1$	8.2	-355	-17 28	120 19	358 30	
$e$	7.3	-369	+ 1 31	144 8	22 19	
$e^1$	+23.7	-147	+ 1 35	145 43	23 54	
$f$	25.4	-150	+21 41	149 45	27 56	
$g$	32.4	+170	- 6 9	156 59	35 10	
$g^1$	34.5	-299	- 7 26	159 47	37 58	
$h$	36.7	-324	+ 8 44	172 37	50 48	
$h^1$	51.0	- 80	+ 9 38	174 53	53 4	
$i$	52.7	- 67	+ 6 9	190 5	68 16	$A$
$i^1$	60.9	-128				

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1861 August 11 23 <sup>h</sup> 58 <sup>m</sup>						
$a^1$	-42.3	+237"	+ 8° 57'	71° 19'	46° 14'	
$a$	40.5	+227	+ 8 58	73 37	48 32	
$a^2$	38.4	+216	+ 8 59	76 11	51 6	
$b^1$	39.1	+415	+19 59	68 17	43 12	
$b$	37.0	+429	+21 27	70 5	45 0	
$b^2$	33.8	+417	+21 49	74 16	49 11	
$c$	9.5	-211	- 7 58	110 23	85 18	
$c^1$	8.0	-211	- 7 36	111 40	86 35	A B
$c^2$	6.5	-207	- 7 0	112 55	87 50	
$c^3$	3.9	-214	- 6 49	115 11	90 6	
$d$	+12.5	-358	-11 57	131 43	106 38	
$e$	20.3	-404	-13 14	139 49	114 44	
$e^1$	22.0	-390	-12 2	141 4	115 59	
$f$	26.9	-422	-13 9	146 33	121 28	$c^3$
$f^1$	27.5	-436	-13 55	147 32	122 27	
$g^1$	50.2	-114	+ 8 54	165 59	140 54	$d^1$
$g$	54.8	-100	+10 9	172 33	147 28	$d$
$g^2$	56.2	-119	+ 9 7	175 13	150 8	$d^5$
$g^3$	57.1	- 93	+10 43	176 27	151 22	$d^6$
August 14 0 <sup>h</sup> 9 <sup>m</sup>						
$a_n$	-50.5	+ 12	- 7 34	63 58	81 6	$a$
$a^1$	49.4	- 7	- 7 52	65 36	82 44	
$b$	44.3	+ 5	- 5 24	71 33	88 41	$a^1$
$b^1$	43.7	- 5	- 5 46	72 25	89 33	
$c$	24.8	-253	-14 37	94 51	111 59	
$c^1$	18.5	-278	-14 20	100 58	118 6	
$c^2$	16.3	-267	-13 4	102 43	119 51	
$c^3$	15.0	-287	-13 56	104 10	121 18	
$d^1$	+11.5	- 32	+ 7 33	122 29	139 37	
$d^2$	16.7	- 45	+ 7 55	127 13	144 21	$b^1$
$d^3$	18.4	- 33	+ 8 59	128 30	145 38	
$d$	19.1	- 23	+ 9 43	129 2	146 10	$b$
$d^4$	20.7	- 16	+10 28	130 22	147 30	
$d^5$	21.4	- 77	+ 7 3	131 54	149 2	$b^3$
$d^6$	22.5	- 42	+ 9 20	132 23	149 31	$b^2$
$d^7$	25.4	+ 21	+13 35	134 14	151 22	$b^5$
$d^8$	34.0	- 9	+13 30	143 5	160 13	$c$
August 16 0 <sup>h</sup> 7 <sup>m</sup>						
$a$	-62.9	+130	- 6 41	35 16	80 32	
$a^1$	59.9	+143	- 4 18	43 8	88 24	
$b^1$	12.9	+ 83	+ 8 11	97 53	143 9	$a^1$
$b$	10.6	+ 94	+ 9 24	99 35	144 51	$a$
$b^2$	7.6	+ 73	+ 9 1	102 32	147 48	
$b^3$	7.6	+ 41	+ 7 11	103 8	148 24	
$b^4$	5.9	+110	+ 9 46	102 20	147 36	
Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
August 18 0 <sup>h</sup> 33 <sup>m</sup>						
$b^5$	- 2.6	+147"	+14° 34'	105° 24'	150° 40'	
$c^1$	+ 6.7	+ 78	+12 57	114 38	159 54	
$c$	8.9	+ 69	+12 58	116 42	161 58	$c$
$d$	30.5	+170	+23 52	135 42	180 58	
$d^1$	34.5	+163	+24 17	140 9	185 25	$c^2$
$e$	63.1	-148	+ 8 52	188 39	233 55	$e_1 e_2$
August 19 3 <sup>h</sup> 27 <sup>m</sup>						
$a^1$	-37.1	+227	+ 8 40	70 4	143 33	$a^1$
$a$	35.6	+229	+ 9 17	71 33	145 2	$a^2$
$a^2$	32.4	+201	+ 8 47	75 32	149 1	
$b$	27.4	-280	-17 23	89 16	162 45	$b$
$b^1$	24.9	-284	-16 49	91 42	165 11	
$c$	+ 5.7	+273	+24 14	108 9	181 38	
$c^1$	7.0	+245	+22 54	109 50	183 19	
$c^2$	10.9	+261	+24 55	113 11	186 40	
$d^s$	45.6	-472	-10 39	164 36	238 5	$d_1 d_2$
$d_n$	46.6	-454	-10 39	164 36	238 5	
$d^1$	47.6	-501	-13 8	169 17	242 46	$d^2$
$d_1^1$	50.0	-522	-14 27	175 46	249 15	$d_1^3$
$d_2^2$	50.8	-515	-13 56	176 57	250 26	
$e_1$	50.2	-149	+ 8 56	160 17	233 46	$e_1$
$e_2$	51.0	-158	+ 8 31	161 40	235 9	$e_2$
$e_1^1$	54.6	-156	+ 9 1	167 13	240 42	$e_2^2$
$e_2^1$	54.6	-172	+ 8 4	167 34	241 3	$e_1^1$
$f$	60.2	- 29	+16 59	176 30	249 59	$f$
$g$	60.7	+144	+27 23	179 40	253 9	$g$
August 19 3 <sup>h</sup> 27 <sup>m</sup>						
$a$	-48.9	+293	+ 7 41	52 47	142 0	
$a^1$	47.8	+300	+ 8 29	53 59	143 12	
$a^2$	46.3	+304	+ 9 18	55 47	145 0	
$b$	41.7	-203	-17 45	72 32	161 45	
$c$	40.2	+434	+18 42	57 26	146 49	
$d_1$	+33.0	-447	-11 36	146 42	235 55	
$d_2$	33.8	-436	-10 45	147 14	236 27	
$d^1$	36.4	-447	-10 58	150 27	239 40	
$d^2$	38.6	-483	-12 50	154 34	243 47	
$d_1^3$	41.8	-515	-13 24	160 31	249 44	
$d_2^3$	43.2	-488	-12 22	161 31	250 44	
$d_3^3$	43.7	-488	-12 22	161 31	250 44	
$e_1 n$	38.5	-104	+ 9 19	144 25	233 38	
$e_2$	39.4	-120	+ 9 10	145 32	234 45	
$e^1$	42.1	-140	+ 8 29	148 52	238 5	
$e_1^2$	44.0	-153	+ 8 4	151 23	240 36	
$e_2^2$	44.0	-139	+ 8 53	151 9	240 22	
$f$	53.2	- 21	+17 14	162 12	251 25	
$g$	54.2	+155	+28 0	164 8	253 21	



Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1861 September 7 23 <sup>h</sup> 30 <sup>m</sup>						
a	-56.9	+128''	- 9° 23'	27° 20'	20° 53'	
b	20.6	-124	- 7 3	74 36	68 9	
c <sup>1</sup>	9.0	-292	-14 20	88 13	81 46	
c <sup>2</sup>	7.0	-225	- 7 41	88 19	81 52	
c	6.4	-264	- 9 41	89 44	83 17	
c <sup>3</sup>	6.0	-271	- 9 56	90 17	83 50	
d	+ 9.4	-383	-11 9	106 0	99 33	b
e	24.5	-112	+ 8 59	112 28	106 1	
f <sup>1</sup>	37.1	-186	+ 8 23	166 37	160 10	c
f	40.0	-193	+ 8 43	129 57	123 30	
f <sup>2</sup>	42.6	-189	+ 9 35	132 57	126 30	d
g	45.0	-275	+ 5 13	138 12	131 45	e <sub>1</sub>
h	54.4	-189	+12 3	149 55	143 28	
September 9 2 <sup>h</sup> 9 <sup>m</sup>						
a	-45.0	+ 60	- 7 20	44 35	67 45	
a <sup>1</sup>	43.4	+ 88	- 5 6	45 41	68 51	
b	18.5	-222	-12 1	76 56	100 6	
c	+10.1	- 60	+ 7 24	96 33	119 43	
d	18.0	- 74	+ 9 13	103 43	126 53	
e <sub>1</sub>	20.3	-172	+ 4 30	107 59	131 9	a
e <sub>2</sub>	21.0	-180	+ 4 15	108 45	131 55	
f	25.4	- 95	+10 21	110 50	134 0	
September 12 2 <sup>h</sup> 35 <sup>m</sup>						
a	-20.2	+ 68	+ 3 15	65 24	130 56	a
b	+ 8.9	-346	- 8 54	99 47	165 19	b
b <sup>1</sup>	9.9	-330	- 7 37	100 13	165 45	
b <sup>2</sup>	11.4	-333	- 7 16	101 34	167 6	
b <sup>3</sup>	14.2	-362	- 8 1	104 45	170 17	
b <sup>4</sup>	14.6	-390	- 9 30	105 59	171 31	b <sup>4</sup>
b <sup>5</sup>	15.1	-351	- 7 4	105 15	170 47	b <sup>3</sup>
c <sup>1</sup>	49.8	-543	- 9 33	156 3	221 35	
c	50.9	-535	- 8 57	158 36	224 8	
September 15 1 <sup>h</sup> 22 <sup>m</sup>						
a	-49.7	+315	+ 2 38	23 37	130 32	
b	31.8	- 61	- 8 45	55 31	162 26	
b <sup>1</sup>	29.3	- 64	- 7 51	57 55	164 50	
b <sup>2</sup>	26.4	- 95	- 8 16	61 13	168 8	
b <sup>3</sup>	24.2	- 93	- 7 16	63 13	170 8	
b <sup>4</sup>	23.5	-144	- 9 49	64 58	171 53	
b <sup>5</sup>	22.7	-140	- 9 15	65 35	172 30	
c	+ 4.0	- 75	+ 4 32	86 0	192 55	
d	48.2	- 18	+21 56	129 4	235 59	
d <sup>1</sup>	49.9	- 19	+22 18	131 35	238 30	c
d <sup>2</sup>	50.4	- 25	+22 5	132 26	239 31	
Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
e <sup>1</sup>	+52.7	-216''	+11° 30'	139° 59'	246° 54'	B
e <sup>2</sup>	53.7	-184	+13 34	140 50	247 45	
e	55.1	-203	+12 42	143 51	250 46	
September 22 2 <sup>h</sup> 43 <sup>m</sup>						
a	-43.0	-130	-18 30	38 52	244 49	
b	28.6	+340	+13 5	39 26	245 23	a
b <sup>1</sup>	26.4	+333	+13 41	41 44	247 41	
b <sup>2</sup>	24.5	+329	+14 19	43 36	249 33	
b <sup>3</sup>	22.4	+322	+14 53	45 44	251 41	
c	27.8	+513	+22 23	32 3	238 0	
dot	11.8	-360	-17 35	73 41	279 38	
d <sub>1</sub> <sup>n</sup>	11.1	-312	-14 51	73 48	279 45	c <sub>1</sub>
d <sub>1</sub> <sup>s</sup>	9.9	-333	-14 51	73 48	279 45	
d <sub>2</sub> <sup>n</sup>	9.1	-329	-14 48	76 6	282 3	c <sub>2</sub>
d <sub>2</sub> <sup>s</sup>	7.3	-347	-14 48	76 6	282 3	
d <sup>1</sup>	5.8	-358	-14 58	78 40	284 37	c <sup>3</sup>
d <sup>2</sup>	4.2	-273	- 9 31	77 38	283 35	c <sup>1</sup> ?c <sup>2</sup>
d <sup>3</sup>	+ 0.5	-345	-11 45	83 26	289 23	
dot	2.6	-424	-15 31	87 30	293 27	
d <sup>4</sup>	2.7	-387	-13 19	86 28	292 25	c <sup>4</sup>
d <sup>5</sup>	3.2	-351	-10 50	86 19	292 16	c <sup>5</sup>
d <sup>6</sup>	4.4	-351	-10 50	86 19	292 16	
d <sup>7</sup>	5.9	-415	-13 43	89 59	295 56	c <sup>7</sup>
e	9.4	-596	-23 25	99 40	305 37	
f	15.1	-436	-11 34	98 29	304 26	d
g <sub>1</sub>	21.3	+ 2	+14 55	91 58	297 55	e
g <sub>2</sub>	21.9	- 2	+14 55	92 35	298 32	
g <sub>3</sub>	22.7	- 7	+14 54	93 23	299 20	
g <sup>1</sup>	24.0	- 7	+15 22	94 38	300 35	e <sup>1</sup>
g <sup>2</sup>	32.6	- 44	+16 14	103 45	309 42	
h <sup>s</sup>	23.9	-568	-15 34	112 4	318 1	f
h <sup>n</sup>	25.2	-546	-15 34	112 4	318 1	
September 24 0 <sup>h</sup> 23 <sup>m</sup>						
a	-43.9	+488	+12 52	13 18	245 57	b <sup>1</sup>
b	36.4	+463	+15 27	23 58	256 37	b
b <sup>1</sup>	33.9	+438	+15 26	28 1	260 40	
b <sup>2</sup>	31.2	+474	+18 33	28 54	261 33	b <sup>2</sup>
c <sub>1</sub> <sup>n</sup>	34.7	-147	-15 50	47 0	279 39	a <sub>1</sub>
c <sub>1</sub> <sup>s</sup>	33.7	-165	-15 50	47 0	279 39	
c <sub>2</sub> <sup>n</sup>	33.0	-166	-15 53	49 24	282 3	a <sub>2</sub>
c <sub>2</sub> <sup>s</sup>	31.2	-182	-15 53	49 24	282 3	
c <sup>1</sup>	30.0	- 92	-10 22	49 28	282 7	
c <sup>2</sup>	29.5	-104	-10 46	50 16	282 55	a <sup>1</sup>
c <sup>3</sup>	29.0	-187	-14 56	52 34	285 13	a <sup>2</sup>
c <sup>4</sup>	22.9	-209	-13 43	58 37	291 16	
c <sup>5</sup>	20.8	-186	-11 31	59 56	292 35	a <sup>3</sup>
c <sup>6</sup>	20.8	-227	-13 51	60 53	293 32	
c <sup>7</sup>	19.3	-228	-14 12	62 12	294 51	





## 1861 October 8—Continued

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$a^2$	-61.6	+157''	-14° 25'	345° 50'	55° 55'	$a^1$
b	23.4	+438	+19 16	24 28	94 33	
$b^1$	18.7	+420	+20 27	29 25	99 30	
c	17.5	-283	-15 45	51 45	121 50	
$c^1$	15.6	-317	-17 23	54 6	124 11	
$c^2$	8.9	-397	-19 9	61 51	131 56	b
d	+43.7	-559	-9 32	118 52	188 57	

October 10 23<sup>h</sup> 12<sup>m</sup>

$a^1$	-39.7	-93	-15 52	24 47	121 17	b
a	37.7	-95	-15 1	26 53	123 23	
$a^2$	37.4	-123	-16 25	27 52	124 22	
b	+26.9	-455	-8 46	92 8	188 38	
c	55.7	-361	+4 56	125 53	222 23	

October 12 23<sup>h</sup> 37<sup>m</sup>

a	-37.2	-30	-11 17	23 56	148 45	a
b	+2.4	-289	-8 41	63 54	188 43	
$b^1$	6.6	-297	-7 29	67 32	192 21	
c	8.6	-492	-17 47	75 29	200 18	
$c^1$	9.9	-494	-17 24	76 36	201 25	
$d^1$	11.9	-539	-19 17	80 6	204 55	$b^2$
d	12.9	-540	-18 59	80 58	205 47	
e	17.2	-179	+2 52	72 52	197 41	$b^3$
$e^1$	17.7	-174	+2 55	73 8	197 57	
$e^2$	18.5	-173	+3 43	73 20	198 9	$dd^1$
$e^3$	19.9	-189	+3 19	75 25	200 14	
$e^4$	20.7	-202	+2 53	76 27	201 16	
f	39.7	-273	+5 29	96 37	221 26	
$f^1$	42.6	-284	+5 47	100 16	225 5	
$f^2$	44.1	-297	+5 31	102 28	227 17	$f^?$
g	39.6	-720	-21 19	124 43	249 32	
h	48.1	-594	-10 57	126 31	251 20	
i	52.0	-552	-7 41	132 22	257 11	
k	53.4	-200	+13 25	112 19	237 8	
l	58.6	-163	+16 53	121 9	245 58	$h^3$

October 14 23<sup>h</sup> 56<sup>m</sup>

a	-24.0	-84	-8 25	35 17	188 21	
b	16.7	-301	-17 18	46 53	199 57	
$b^1$	15.1	-349	-19 21	49 31	202 35	
$b^2$	13.6	-358	-19 13	51 2	204 6	
$b^3$	12.5	-365	-19 11	52 5	205 9	
c	2.6	-233	-7 42	56 26	209 30	
$c^1$	1.8	-273	-9 35	58 10	211 14	
$c^2$	0.3	-237	-7 0	58 24	211 28	
$c^3$	+1.1	-294	-9 35	61 3	214 7	

d	+13.9	-102''	+5° 37'	66° 5'	219° 9'	b
$d^1$	14.4	-102	+5 46	66 27	219 31	
$d^2$	15.7	-98	+6 28	67 25	220 29	
$d^3$	18.9	-144	+5 12	71 20	224 24	
$d^4$	19.7	-130	+6 15	71 39	224 43	
$d^5$	21.0	-146	+5 51	73 10	226 14	$c^2?$
$d^6$	21.7	-158	+5 26	74 3	227 7	
e	23.4	-624	-20 18	92 34	245 38	
f	26.7	-675	-22 19	99 13	252 17	
g	32.7	-539	-11 58	97 32	250 36	
$h^1$	33.3	-116	+11 48	83 38	236 42	c
h	34.3	-98	+13 6	84 8	237 12	
$h^2$	36.1	-105	+13 21	86 11	239 15	
$h^3$	41.0	-61	+17 25	90 27	243 31	
i	38.5	-513	-8 34	102 47	255 51	
$i^1$	39.8	-506	-7 7	103 21	256 25	$d^4?$
$i^2$	44.2	-544	-8 47	112 12	265 16	
$i^3$	45.1	-553	-4 18	113 20	266 24	
k	42.4	-664	-16 51	120 13	273 17	
$k^1$	42.8	-691	-18 43	124 59	278 3	
l	45.2	-637	-14 25	122 55	275 59	$d^5$
$l^1$	45.2	-653	-15 33	125 16	278 20	
$m^1$	56.3	-37	+23 29	111 37	264 41	$e^1$
m	58.0	-50	+23 8	115 3	268 7	

October 20 23<sup>h</sup> 41<sup>m</sup>

a	-53.3	+107	-11 24	354 6	231 14	$a^1$
b	52.1	+431	+5 7	340 54	218 2	b
$c^1$	43.4	+28	-10 50	9 12	246 20	$a^3$
$c^2$	40.5	+5	-11 4	11 58	249 6	a
c	36.5	+9	-9 3	15 53	253 1	
$c^3$	30.2	-44	-9 10	23 2	260 10	
$c^4$	28.7	-37	-7 59	24 2	261 10	
$c^5$	27.9	-79	-10 4	25 55	263 3	
$d^1$	23.8	-195	-14 43	32 13	269 21	$c^1$
$d^2$	22.7	-211	-15 6	33 36	270 44	$c^2$
$d^3$	20.3	-229	-15 7	36 1	273 9	$c^3$
$d^4$	18.0	-291	-17 39	39 30	276 38	c
d	17.0	-240	-14 21	39 3	276 11	
$d^5$	14.6	-287	-15 59	42 13	279 21	
$d^6$	10.9	-347	-17 56	46 52	284 0	
$d^7$	9.3	-310	-15 7	47 8	284 16	
$e^1$	3.9	+391	+24 39	31 41	268 49	$d_1$
e	0.2	+415	+27 34	33 56	271 4	
$e^2$	+2.6	+440	+30 12	35 23	272 31	
$f^1$	14.0	-347	-8 15	66 54	304 2	
$f_1$	19.8	-505	-15 4	77 20	314 28	
$f_2$	19.8	-513	-15 33	77 40	314 48	$d_2$
$g^1$	36.8	-21	+17 31	78 42	315 50	$e^1$
$g_1$	38.5	-32	+17 29	80 44	317 52	e
$g_2$	39.1	-44	+17 1	81 37	318 45	$e^3$

Letter	<i>da</i>	<i>dδ</i>	<i>b</i>	<i>L</i>	<i>L'</i>	Letter on next date	Letter	<i>da</i>	<i>dδ</i>	<i>b</i>	<i>L</i>	<i>L'</i>	Letter on next date
1861 October 20—Continued													
<i>g</i> <sup>2</sup>	+40.9	— 70''	+16° 13'	84° 8'	321° 16'	<i>e</i> <sup>5</sup>	<i>e</i> <sup>1</sup>	+35.8	— 35''	+15° 39'	72° 40'	20° 5'	<i>d</i> <sup>1</sup>
<i>g</i> <sup>3</sup>	42.1	— 68	+16 40	85 23	322 31	<i>e</i> <sup>6</sup>	<i>f</i> <sup>1</sup>	36.7	—626	—17 13	95 45	43 10	<i>e</i> <sup>1</sup>
<i>h</i>	62.1	—227	+13 2	123 44	0 52	<i>j</i>	<i>f</i> <sup>2</sup>	37.6	—624	—16 50	96 45	44 10	<i>e</i> <sup>2</sup>
October 21 o <sup>b</sup> 24 <sup>m</sup>							<i>f</i> <sup>3</sup>	39.1	—624	—16 23	98 45	46 10	<i>e</i> <sup>3</sup>
<i>a</i> <sup>1</sup>	—58.9	+164	—11 35	341 52	233 27		<i>f</i> <sub>1</sub>	40.2	—615	—15 31	99 30	46 55	<i>e</i> <sub>1</sub> <sup>g</sup>
<i>a</i> <sup>2</sup>	54.8	+139	—10 44	349 52	241 27		<i>f</i> <sub>2</sub>	40.6	—622	—15 50	100 41	48 6	<i>e</i> <sub>2</sub>
<i>a</i> <sup>3</sup> n	52.9	+110	—11 32	353 41	245 16		<i>g</i> <sub>1</sub>	49.8	— 14	+21 25	88 29	35 54	<i>f</i> <sub>1</sub>
<i>a</i> <sub>s</sub>	47.2	+ 98	— 9 11	1 14	252 49		<i>g</i> <sub>2</sub>	50.3	— 16	+21 27	89 13	36 38	<i>f</i> <sub>2</sub>
<i>a</i> <sup>4</sup>	41.6	+ 35	—10 5	9 5	260 40		<i>g</i> <sup>1</sup>	51.3	— 16	+21 46	90 37	38 2	<i>f</i> <sub>2</sub>
<i>a</i> <sup>5</sup>	40.2	+ 37	— 9 12	10 33	262 8		October 26 23 <sup>h</sup> 37 <sup>m</sup>						
<i>b</i>	55.5	+489	+ 5 48	326 3	217 38		<i>a</i>	—51.0	— 6	—16 19	354 29	315 46	<i>a</i>
<i>c</i> <sup>1</sup>	35.8	—105	—14 57	18 15	269 50		<i>b</i>	38.6	+531	+16 58	347 54	309 12	<i>b</i> <sup>1</sup>
<i>c</i> <sup>2</sup>	35.1	—118	—15 22	19 13	270 48		<i>b</i> <sup>1</sup>	37.1	+509	+16 32	351 0	312 18	<i>b</i> <sup>2</sup>
<i>c</i> <sup>3</sup>	34.2	—130	—15 37	20 20	271 55		<i>b</i> <sup>2</sup>	35.5	+493	+16 26	353 36	314 54	<i>b</i>
<i>c</i>	29.8	—146	—14 35	24 46	276 21	<i>a</i>	<i>b</i> <sup>3</sup>	35.5	+466	+15 3	355 2	316 20	
<i>c</i> <sup>4</sup>	27.6	—192	—16 12	27 49	279 24		<i>c</i> <sub>1</sub>	+ 2.7	+124	+12 19	39 18	0 36	<i>c</i> <sub>1</sub>
<i>c</i> <sup>5</sup>	20.1	—240	—15 41	35 26	287 1		<i>c</i> <sub>2</sub>	3.5	+124	+12 37	39 56	1 14	<i>c</i> <sub>2</sub>
<i>d</i> <sub>1</sub>	+ 7.4	—430	—15 27	63 5	314 40	<i>b</i>	<i>c</i> <sup>1</sup>	3.1	+156	+14 11	38 47	0 4	<i>c</i> <sup>1</sup>
<i>d</i> <sub>2</sub>	7.4	—437	—15 51	63 20	314 55		<i>c</i> <sup>2</sup>	4.1	+175	+15 34	39 2	0 20	<i>c</i> <sup>2</sup> ?
<i>e</i> <sup>1</sup>	24.1	+ 48	+16 40	63 54	315 29		<i>c</i> <sup>3</sup>	5.3	+119	+13 0	41 28	2 46	<i>c</i> <sup>1</sup>
<i>e</i> <sup>2</sup>	25.2	+ 2	+14 34	66 0	317 35		<i>c</i> <sup>4</sup>	6.0	+175	+16 18	40 37	1 54	
<i>e</i>	26.4	+ 47	+17 27	66 1	317 36		<i>c</i> <sup>5</sup>	6.7	+161	+15 48	41 33	2 50	
<i>e</i> <sup>3</sup>	27.0	+ 35	+17 1	66 52	318 27		<i>c</i> <sup>6</sup>	9.0	+137	+15 22	44 1	5 18	
<i>e</i> <sup>4</sup>	27.9	+ 63	+18 53	67 6	318 41		<i>d</i>	22.0	+ 60	+15 54	56 44	18 2	
<i>e</i> <sup>5</sup>	29.0	+ 12	+16 27	69 12	320 47		<i>d</i> <sup>1</sup>	23.7	+ 32	+15 0	58 54	20 12	
<i>e</i> <sup>6</sup>	30.5	+ 2	+16 27	70 53	322 28		<i>e</i> <sup>1</sup>	27.4	—583	—17 48	81 42	43 0	
<i>e</i> <sup>7</sup>	35.3	— 35	+16 4	76 21	327 56		<i>e</i> <sup>2</sup>	28.9	—587	—17 31	83 27	44 44	<i>f</i> <sup>1</sup>
<i>f</i>	57.5	—213	+12 56	109 50	1 25	<i>d</i> <sub>1</sub> <i>d</i> <sub>2</sub>	<i>e</i> <sup>3</sup>	31.0	—581	—16 28	85 18	46 36	<i>f</i> <sup>2</sup>
<i>f</i> <sup>1</sup>	58.2	—206	+13 26	111 2	2 37	<i>d</i> <sup>2</sup>	<i>e</i> <sub>1</sub>	32.3	—568	—15 16	85 57	47 15	<i>f</i> <sub>1</sub>
<i>g</i>	63.8	—169	+16 26	125 49	17 24	<i>e</i>	<i>e</i> <sub>2</sub>	32.8	—579	—15 45	87 7	48 24	<i>f</i> <sub>2</sub>
October 25 23 <sup>h</sup> 53 <sup>m</sup>							<i>e</i> <sup>4</sup>	33.5	—596	—16 34	88 49	50 6	
<i>a</i>	—62.9	+130	—15 18	330 5	277 30		<i>f</i> <sub>1</sub>	40.1	+ 43	+21 18	74 37	35 54	<i>g</i> <sub>1</sub>
<i>b</i>	41.6	— 80	—16 9	7 56	315 21	<i>a</i>	<i>f</i> <sub>2</sub>	40.8	+ 45	+21 40	75 24	36 42	<i>g</i> <sub>2</sub>
<i>c</i>	30.0	+440	+16 2	2 31	309 56	<i>b</i>	<i>f</i> <sup>1</sup>	41.4	+ 62	+22 49	75 47	37 5	<i>g</i> <sup>4</sup>
<i>c</i> <sup>1</sup>	28.1	+427	+16 12	4 56	312 21	<i>b</i> <sup>1</sup>	<i>f</i> <sup>2</sup>	41.9	+ 45	+22 2	76 39	37 56	<i>g</i> <sup>5</sup>
<i>c</i> <sup>2</sup>	27.4	+414	+15 49	6 8	313 33		<i>f</i> <sup>3</sup>	42.9	+ 24	+21 11	78 10	39 28	
<i>c</i> <sup>3</sup>	25.8	+416	+16 36	7 30	314 55		<i>f</i> <sup>4</sup>	44.7	+ 57	+23 39	79 45	41 2	
<i>c</i> <sup>4</sup>	25.8	+363	+13 49	9 39	317 4		October 27 23 <sup>h</sup> 57 <sup>m</sup>						
<i>d</i> <sub>1</sub>	+16.3	+ 35	+12 38	53 28	0 53	<i>c</i> <sub>1</sub>	<i>a</i>	—58.5	+ 56	—16 34	340 38	315 59	<i>a</i>
<i>d</i> <sub>2</sub>	17.1	+ 35	+12 56	54 11	1 36	<i>c</i> <sub>2</sub>	<i>b</i> <sup>1</sup>	45.1	+590	+16 55	333 37	308 58	
<i>d</i> <sup>1</sup>	17.6	+ 51	+13 58	54 10	1 35		<i>b</i> <sup>2</sup>	44.5	+570	+16 14	336 24	311 45	<i>c</i>
<i>d</i> <sup>2</sup>	18.3	+ 32	+13 11	55 13	2 38	<i>c</i> <sup>3</sup>	<i>b</i>	42.7	+559	+16 33	339 53	315 14	<i>c</i> <sup>1</sup>
<i>d</i> <sup>3</sup>	19.4	+ 68	+15 33	55 21	2 46	<i>c</i> <sup>5</sup>	<i>c</i> <sup>1</sup>	11.8	+254	+13 34	23 8	358 29	
<i>d</i> <sup>4</sup>	21.6	+ 44	+15 3	57 48	5 13	<i>c</i> <sup>6</sup>	<i>c</i> <sup>2</sup>	11.4	+263	+14 16	23 11	358 32	<i>d</i> <sup>1</sup>
<i>e</i>	33.8	— 19	+15 51	70 20	17 45	<i>d</i>	<i>c</i> <sub>1</sub>	10.9	+222	+12 16	24 49	0 10	<i>d</i> <sub>1</sub>
							<i>c</i> <sub>2</sub>	10.1	+222	+12 35	25 28	0 49	<i>d</i> <sub>2</sub>
							<i>c</i> <sup>3</sup>	8.6	+223	+13 13	26 38	1 59	<i>d</i> <sup>4</sup>
							<i>c</i> <sup>4</sup>	8.0	+213	+12 55	27 24	2 45	<i>d</i> <sup>3</sup>



1861 October 27—Continued

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$d$	-0.8	-291"	-11° 22'	46° 14'	21° 35'	$e^1$
$d^1$	0.2	-287	-10 55	46 34	21 55	
$d^2$	+1.5	-298	-10 55	48 12	23 33	$e^2$
$d^3$	3.8	-343	-12 35	51 15	26 36	$e_1 e_2$
$e$	7.7	+130	+14 23	42 9	17 30	$f$
$e^1$	8.9	+162	+16 34	42 19	17 40	
$e^2$	10.0	+74	+12 13	45 24	20 45	
$f^1$	17.7	-523	-17 49	68 54	44 15	
$f^2$	20.6	-527	-17 1	71 38	47 0	$g^2$
$f^3$	21.4	-557	-18 31	73 42	49 3	
$f_1$	22.1	-507	-15 19	72 8	47 29	$g_1$
$f_2$	22.8	-512	-15 22	72 59	48 20	$g_2$
$g^1$	25.3	+39	+15 47	59 9	34 30	
$g^2$	26.0	+102	+19 30	58 24	33 45	$h^1$
$g^3$	28.2	+88	+19 31	60 43	36 4	$h^3$
$g_1$	28.6	+119	+21 23	60 25	35 46	$h_1$
$g_2$	29.4	+118	+21 38	61 15	36 36	$h_2$
$g^4$	29.4	+134	+22 32	60 55	36 16	
$g^5$	30.0	+123	+22 17	61 44	37 5	
$g^6$	30.9	+115	+22 0	62 46	38 7	$h^5$

October 28 0<sup>h</sup> 16<sup>m</sup>

$a$	-63.6	+104	-16 40	326 38	316 22	
$b$	60.5	+155	-12 11	332 52	322 36	
$c$	48.8	+619	+16 25	321 31	311 15	
$c^1$	47.5	+614	+16 37	325 31	315 15	
$d^1$	24.8	+362	+14 35	6 5	355 49	$a^1$
$d_1$	23.8	+317	+12 11	10 14	359 58	$a_1$
$d_2$	23.0	+319	+12 37	10 53	0 37	$a_2$
$d^2$	21.5	+333	+13 57	11 37	1 21	
$d^3$	21.5	+308	+12 37	12 29	2 13	
$d^4$	21.2	+321	+13 27	12 20	2 4	
$e^1$	15.7	-202	-12 15	31 2	20 46	$b_1$
$e^2$	11.8	-194	-10 17	34 1	23 45	$c^1$
$e^3$	10.5	-248	-12 46	36 24	26 8	
$e_1$	9.7	-248	-12 28	37 0	26 44	$c_1$
$e_2$	9.3	-244	-12 6	37 12	26 56	$c_2$
$f$	6.0	+232	+14 39	27 31	17 15	
$f^1$	4.4	+220	+14 35	29 6	18 50	
$f^2$	+0.4	+158	+13 4	34 37	24 21	
$f^3$	1.2	+266	+19 13	32 17	22 1	
$g^1$	7.1	-454	-17 52	56 17	46 1	
$g^2$	8.4	-449	-17 2	57 15	46 59	
$g_1$	10.1	-432	-15 26	58 4	47 48	$d_1$
$g_2$	11.0	-435	-15 18	58 52	48 36	$d_2$
$g^3$	17.3	-315	-6 20	60 19	50 3	
$h^1$	12.1	+202	+19 49	42 58	32 42	
$h^2$	14.7	+185	+19 50	45 34	35 18	
$h^3$	15.7	+176	+19 43	46 39	36 23	$e^3$

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$h_1$	+15.7	+209"	+21° 34'	45° 51'	35° 35'	$e_1$
$h_2$	16.7	+204	+21 39	46 50	36 34	$e_2$
$h^4$	17.3	+190	+21 6	47 41	37 25	
$h^5$	18.5	+199	+22 2	48 31	38 15	

October 29 0<sup>h</sup> 36<sup>m</sup>

$a^1$	-35.3	+445	+14 9	353 23	357 21	
$a_1$	34.6	+403	+12 18	356 10	0 8	$b$
$a_2$	34.0	+408	+12 47	356 29	0 27	
$b_1$	28.9	-95	-11 37	16 23	20 21	$a^1$
$b_2$	28.2	-100	-11 36	17 10	21 8	
$c^1$	24.4	-114	-10 52	20 43	24 41	
$c_1$	23.0	-141	-11 47	22 31	26 29	$a^2$
$c_2$	22.5	-146	-11 52	23 4	27 2	
$d^1$	3.4	-369	-16 58	44 13	48 11	
$d_1$	2.8	-347	-15 29	44 5	48 3	$c$
$d_2$	1.8	-348	-15 11	44 52	48 50	$c^1$
$e^1$	1.5	+273	+18 29	28 55	32 53	
$e^2$	+0.1	+315	+21 25	28 59	32 57	$d^1$
$e^3$	2.3	+273	+19 55	31 58	35 56	
$e_1$	2.8	+300	+21 37	31 38	35 36	
$e_2$	3.7	+294	+21 37	32 34	36 32	
$e^4$	4.6	+301	+22 22	33 6	37 4	

November 1 23<sup>h</sup> 22<sup>m</sup>

$a^1$	-58.4	+118	-12 28	334 53	20 14	
$a$	55.3	+55	-14 25	341 32	26 53	
$a^2$	54.7	+86	-12 29	341 35	26 56	
$a^3$	54.2	+90	-12 3	342 11	27 32	
$b$	52.7	+559	+12 16	317 9	2 30	
$c$	39.6	-90	-15 38	3 19	48 40	
$c^1$	38.7	-88	-15 10	4 10	49 31	
$d^1$	32.3	+531	+20 9	349 28	34 49	
$d$	30.9	+526	+20 27	350 6	35 27	
$dot$	30.3	+548	+21 56	350 35	35 57	
$d^2$	29.9	+521	+20 36	352 21	37 42	
$e^1$	+39.3	-577	-14 48	87 56	133 17	
$e^2$	41.3	-615	-16 30	93 25	138 46	
$e^3$	44.2	-548	-11 39	92 33	137 54	
$e$	44.8	-570	-12 49	95 0	140 21	
$f$	51.8	-478	-5 33	99 57	145 18	
$g$	63.7	-30	+22 49	106 26	151 47	

November 10 23<sup>h</sup> 28<sup>m</sup>

$a$	-31.2	-124	-14 9	2 46	174 29	$a^1$
$a^1$	29.7	-129	-13 58	4 12	175 55	$a$
$a^2$	25.5	-168	-14 35	8 42	180 25	
$a^3$	24.7	-60	-8 0	6 58	178 41	
$a^4$	22.3	-37	-6 15	8 36	180 19	

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1861 November 10—Continued						
$b$	-2 <sup>s</sup> 3	+67''	+6° 0'	22° 6'	193° 49'	
$b^1$	1.5	+58	+5 46	22 53	194 36	
$c$	+13.7	-367	-12 41	45 4	216 47	
$c^1$	14.2	-335	-10 43	44 34	216 17	$b^1$
$c^2$	15.4	-356	-11 31	46 7	217 50	
$c^3$	17.0	-397	-13 19	48 44	220 27	$b$
$c^4$	19.1	-433	-14 43	51 41	223 24	$b^2$
$d$	27.8	-399	-10 5	58 8	229 51	
$d^1$	28.7	-419	-10 57	59 38	231 21	
$d^2$	29.8	-442	-11 56	61 27	233 10	
$e$	47.7	-600	-16 8	92 4	263 47	
$e^1$	48.0	-584	-15 4	91 8	262 51	$e$
November 12 1 <sup>h</sup> 18 <sup>m</sup>						
$a^1$	-53.5	+35	-13 17	334 0	174 51	
$a$	52.8	+39	-12 45	334 58	175 49	
$b^1$	14.3	-178	-11 25	16 2	216 53	
$b$	10.9	-224	-12 53	19 45	220 36	$a$
$b^2$	8.8	-264	-14 28	22 16	223 7	
$b^3$	7.9	-277	-14 54	23 17	224 8	
$c$	+17.4	+167	+17 30	33 34	234 25	$c$
$c^1$	23.2	+164	+19 11	38 38	239 29	$c^2?$
$c^2$	23.7	+162	+19 14	39 9	240 0	$c^3?$
$d_1$	30.1	+7	+12 32	47 45	248 36	$d_1$
$d_2$	30.6	+2	+12 23	48 15	249 6	$d_2$
$d^1$	32.9	-7	+12 35	50 34	251 25	
$d^2$	33.5	-30	+11 30	51 35	252 26	$d^2$
$d^3$	34.2	-35	+11 26	52 20	253 11	
$d^4$	35.1	-25	+12 14	52 56	253 47	$d^4$
$d^5$	35.6	-13	+13 2	53 11	254 2	$d^5$
$d^6$	36.0	-21	+12 44	53 46	254 37	$d^6$
$d^7$	36.3	-28	+12 26	54 11	255 2	
$e$	31.4	-487	-14 34	62 28	263 19	
November 14 0 <sup>h</sup> 37 <sup>m</sup>						
$a$	-37.1	-75	-13 20	352 13	220 44	
$b$	21.5	+553	+26 26	347 30	216 1	$b$
$c$	11.9	+343	+17 44	3 40	232 11	$c$
$c^1$	6.7	+324	+18 21	8 25	236 56	
$c^2$	3.1	+303	+18 20	11 54	240 25	$d$
$c^3$	2.1	+301	+18 33	12 45	241 16	
$d_1$	+0.5	+186	+12 58	17 37	246 8	$e$
$d_2$	1.6	+186	+13 18	18 27	246 58	
$d^1$	2.3	+167	+12 29	19 29	248 0	$e^1$
$d^2$	6.3	+121	+11 12	23 39	252 10	$e^5$
$d^3$	7.2	+163	+13 47	23 28	251 59	
$d^4$	8.6	+116	+11 37	25 35	254 6	$e^7$
Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
$d^5$	+9 <sup>s</sup> 7	+146''	+13° 37'	25° 50'	254° 21'	$e^6$
$d^6$	10.7	+119	+12 26	27 12	255 43	$e^8$
November 15 0 <sup>h</sup> 11 <sup>m</sup>						
$a$	-36.3	-41	-11 7	351 22	233 40	
$b$	31.9	+611	+26 9	333 8	215 26	
$c$	25.8	+422	+17 33	348 21	230 39	$a$
$c^1$	24.5	+421	+17 56	349 32	231 50	
$c^2$	23.4	+403	+17 17	351 10	233 28	
$d$	16.3	+378	+18 10	357 59	240 17	
$e$	14.4	+271	+12 53	2 42	245 0	$b_1 b_2$
$e^1$	13.2	+264	+12 53	3 52	246 10	$b^2$
$e^2$	11.9	+239	+11 55	5 34	247 52	$b^1$
$e^3$	9.0	+246	+13 14	7 44	250 2	
$e^4$	7.4	+210	+11 44	9 52	252 10	
$e^5$	7.2	+201	+11 19	10 17	252 35	
$e^6$	5.4	+237	+13 51	10 47	253 5	
$e^7$	5.1	+205	+12 11	11 48	254 6	$b^4$
$e^8$	3.4	+205	+12 43	13 11	255 29	
$f^1$	+1.8	+55	+6 3	20 31	262 49	
$f$	3.1	+67	+7 7	21 19	263 37	$b^7$
$g_1$	66.3	-121	+14 12	97 14	339 32	$d_2$
$g_2$	66.7	-103	+15 18	98 12	340 30	$d_1$
November 18 0 <sup>h</sup> 23 <sup>m</sup>						
$a$	-51.7	+571	+17 20	305 47	230 18	
$b_1$	48.7	+468	+12 51	319 23	243 54	$a$
$b_2$	47.9	+464	+12 53	320 38	245 9	
$b^1$	47.7	+433	+11 17	322 34	247 5	
$b^2$	47.3	+452	+12 26	322 5	246 36	
$b^3$	46.1	+403	+10 12	326 4	250 35	$a^1$
$b^4$	42.3	+424	+12 35	329 29	254 0	$a^2$
$b^5$	42.3	+400	+11 16	330 32	255 3	$a^3$
$b^6$	40.7	+430	+13 26	330 58	255 29	$a^4$
$b^7$	39.9	+308	+7 2	336 27	260 58	$a^7$
$c^1$	+6.5	-324	-13 58	29 24	313 55	$a^5$
$c^2$	7.7	-337	-14 22	30 39	315 10	$b^1$
$c^3$	10.7	-370	-15 23	33 59	318 30	$b^2$
$c$	11.9	-372	-15 9	34 58	319 29	$b^3$
$d_1$	42.1	+23	+15 18	52 54	337 25	$b$
$d_2$	42.5	+9	+14 37	53 34	338 5	$c_1$
$d^1$	43.7	+7	+14 49	54 49	339 20	$c_2$
$d^2$	44.5	-35	+12 41	56 21	340 52	$c^1$
$d^3$	45.7	-39	+12 46	57 42	342 13	$c^2$
$d^4$	49.6	-85	+11 13	62 58	347 29	$c^3$
$d^5$	50.6	-23	+15 0	63 13	347 44	$c^4$
$d^6$	51.7	-74	+12 23	65 20	349 51	$c^5$
$d^7$	51.7	-87	+11 40	65 34	350 5	$c^6$
$d^8$	53.6	+29	+18 45	66 23	350 54	$c^7$
$d^9$	54.6	+30	+19 4	67 45	352 16	$c^9$



Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1861 November 19 0 <sup>h</sup> 2 <sup>m</sup>						
$a^1$	-55.2	+460''	+10° 26'	308° 32'	246° 53'	
$a$	54.8	+501	+12 45	305 45	244 6	
$a^2$	54.1	+494	+12 38	307 52	246 13	$a$
$a^3$	54.1	+438	+ 9 39	312 6	250 27	
$a^4$	50.6	+470	+12 33	315 41	254 2	$a^1$
$a^5$	50.1	+363	+ 6 55	322 0	260 21	
$a^6$	49.2	+474	+13 14	317 24	255 45	$a^2$
$a^7$	48.9	+483	+13 49	317 16	255 37	$a^3$
$b^1$	7.8	-243	-13 41	15 11	313 32	$b^1$
$b^2$	6.6	-261	-14 20	16 34	314 55	$b^2$
$b^3$	2.9	-297	-15 21	20 12	318 33	
$b$	2.0	-302	-15 17	21 21	319 42	$b$
$c_1$	+28.2	+102				
$c_1$ s	29.3	+ 81	+15 12	38 3	336 24	$c_1$
$c_2$ n	29.3	+ 76				
$c_2$ s	30.4	+ 62	+14 14	39 24	337 45	$c_2$
$c^1$	32.8	+ 28	+12 45	42 47	341 8	$c^1$
$c^2$	35.4	+ 2	+12 0	45 38	343 59	$c^3$
$c^3$	37.5	- 37	+10 23	48 19	346 40	$c^4$
$c^4$	38.3	+ 28	+14 15	47 58	346 19	
$c^5$	40.1	- 53	+10 12	51 9	349 30	
$c^6$	40.8	- 39	+11 10	51 36	349 57	
$c^7$	41.5	+ 46	+16 9	50 59	349 20	
$c^8$	41.6	- 31	+11 50	52 17	350 38	$c^6$
$c^9$	43.5	+ 83	+18 49	52 38	350 59	$c^8$
November 20 0 <sup>h</sup> 6 <sup>m</sup>						
$a$	-57.7	+514	+12 38	294 53	247 19	
$a^1$	56.0	+494	+12 12	302 55	255 21	
$a^2$	55.4	+502	+12 54	303 37	256 3	
$a^3$	54.9	+512	+13 38	303 43	256 9	
$b^1$	20.1	-173	-13 25	2 43	315 9	
$b^2$	19.1	-176	-13 18	3 36	316 2	
$b$	16.5	-228	-15 11	6 5	318 31	
$c_1$ n		+175				
$c_1$ s	+14.0	+152	+14 55	23 15	335 41	$a$
$c_2$	14.7	+159	+14 51	23 52	336 18	
$c_3$ n	15.3	+144				
$c_3$ s	16.6	+137	+14 10	25 16	337 42	$a^1$
$c^1$	18.1	+ 98	+12 23	27 49	340 15	$a^2$
$c^2$	18.3	+148	+15 15	27 6	339 32	
$c^3$	20.4	+ 84	+12 14	29 59	342 25	
$c^4$	23.9	+ 43	+10 54	33 37	346 3	$a^4$
$c^5$	27.0	+ 98	+14 51	35 25	347 51	$a^5$
$c^6$	29.3	+ 41	+12 16	38 21	350 47	
$c^7$	29.9	+ 84	+14 51	38 11	350 37	
$c^8$	31.4	+152	+19 10	38 35	351 1	$a^6$
$d$	56.3	-534	-13 26	92 46	45 12	$b$
Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1861 November 22 0 <sup>h</sup> 33 <sup>m</sup>						
$a$	-16.4	+303''	+13° 34'	354° 38'	335° 24'	$a$
$a^1$	13.3	+278	+13 27	357 2	337 48	$a^2$
$a^2$	11.4	+239	+11 47	359 27	340 13	$a^1$
$a^3$	5.0	+255	+14 28	4 13	344 59	$a^4$
$a^4$	1.4	+164	+12 8	8 6	348 52	
$a^5$	0.8	+251	+15 25	7 40	348 26	$a^5$
$a^6$	+ 6.1	+264	+18 6	12 58	353 44	
$b$	44.9	-482	-14 28	65 36	46 22	$c_1$
$b^1$	45.7	-502	-14 39	67 53	48 39	
$b^2$	45.9	-557	-17 52	71 36	52 22	$c^4$
November 24 0 <sup>h</sup> 0 <sup>m</sup>						
$a$	-40.6	+413	+13 43	327 26	335 56	$a_1$
$a_1^1$	39.0					
$a_1^2$	39.6					
$a_2^1$	38.8	+358	+10 55	330 28	338 58	$a^1$
$a_2^2$	37.9					
$a^2$	38.3	+403	+13 34	329 21	337 51	$a_2$
$a^3$	36.8	+401	+13 54	330 59	339 29	$a^4$
$a^4$	34.6	+404	+14 44	333 14	341 44	
$a^5$	30.6	+379	+14 23	337 40	346 10	$a^6$
$b$	30.9	- 92	- 9 59	347 24	355 54	$b$
$b^1$	19.9	-175	-13 37	358 38	7 8	
$c^1$	+20.7	-379	-14 32	35 54	44 24	$e^1$
$c^2$	20.7	-406	-16 6	36 41	45 11	$e^2$
$c_1$	23.6	-377	-13 40	38 20	46 50	$e$
$c_2$	23.9	-390	-14 19	39 1	47 31	
$c^3$	25.7	-443	-16 57	42 16	50 46	
$c^4$	27.7	-445	-16 33	44 10	52 40	
November 25 0 <sup>h</sup> 6 <sup>m</sup>						
$a_1$	-48.9	+464	+14 11	313 24	336 0	$b$
$a_2$	48.0	+459	+14 11	314 57	337 33	
$a^1$	49.2	+407	+10 54	315 57	338 33	$b^1$
$a^2$	48.2	+409	+11 21	317 5	339 41	
$a^3$	46.4	+482	+15 54	315 43	338 19	$b^2$
$a^4$	46.2	+450	+14 10	317 39	340 15	
$a^5$	45.5	+475	+15 46	317 15	339 51	$b^3$
$a^6$	43.6	+435	+14 4	321 35	344 11	
$a^7$	40.7	+470	+16 51	323 11	345 47	$b^5$
$a^8$	40.1	+440	+15 19	325 7	347 43	
$b$	44.8	- 12	-11 9	332 15	354 51	$a^2 a^1$
$c^1$	8.5	+288	+15 13	357 57	20 33	
$c$	5.7	+270	+14 57	0 36	23 12	
$d$	+ 8.4	+ 5	+ 3 43	16 46	39 22	
$e^1$	6.7	-307	-14 15	21 29	44 5	$c^1$
$e^2$	8.0	-343	-15 59	23 21	45 57	$c^2$
$l$ n	10.1	-311				
$l$ s	10.8	-327	-13 58	24 46	47 22	$c$

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1861 November 26 2 <sup>h</sup> 9 <sup>m</sup>						
$a$	-58.0	+ 71''	- 9° 52'	313° 48'	351° 37'	$a_1$
$a^1$	55.0	+ 39	-10 54	318 29	356 18	$a$
$b^1$	57.0	+446	+11 9	300 26	338 15	$b^1$
$b$	55.7	+500	+14 33	298 33	336 22	$b$
$b^2$	54.1	+520	+16 6	299 46	337 35	
$b^3$	53.6	+509	+15 42	302 14	340 3	
$b^4$	51.8	+440	+12 16	309 31	347 20	
$b^5$	50.6	+502	+16 9	307 49	345 38	
$b^6$	49.7	+527	+17 48	307 17	345 6	$b^2$
$c^1$	9.5	-214	-13 14	5 32	43 21	
$c^2$	8.6	-255	-15 21	7 1	44 50	
$c$ n	6.0	-225	-13 18	9 11	47 0	$c$
$c$ s	4.8	-242				
$c^3$	1.8	-299	-16 10	13 18	51 7	$c^2$
$d$	+11.7	-274	-11 18	23 38	61 27	$d$
$e$ n	68.3	- 39	+14 36	87 16	125 5	$e$
$e$ s		- 62				
$e^1$	68.7	- 81	+12 54	89 55	127 44	$e^1$
November 27 0 <sup>h</sup> 10 <sup>m</sup>						
$a$	-64.6	+101	- 9 47	300 44	351 26	
$a^1$	61.8	+ 76	-10 24	306 44	357 26	
$b^1$	60.9	+454	+10 44	287 44	338 26	
$b$	58.6	+506	+14 18	288 39	339 21	
$b^2$	54.8	+539	+17 18	295 39	346 21	
$c^1$	20.9	-216	-16 22	355 9	45 51	
$c$ n	19.1	-175	-13 52	354 35	47 17	$a$
$c$ s	18.1	-191				
$c^2$	14.9	-252	-16 55	0 44	51 26	
$d$	2.0	-209	-11 10	10 25	61 7	
$e$ s		- 46				
$e$ n	+64.1	- 21	+14 21	74 6	124 48	$d$
$e^1$	65.9	- 78	+12 9	78 37	129 19	$d^3$
$e^2$	67.5	- 53	+13 56	83 5	133 47	$d^6$
December 2 1 <sup>h</sup> 1 <sup>m</sup>						
$a$	-68.3	+ 14	-14 1	288 8	49 30'	
$b$	44.0	+225	+ 3 29	321 46	83 8	$a$
$c$	9.4	-129	- 8 54	357 52	119 14	
$d$ s	+ 4.7	+197	+13 28	4 36	125 58	$c$
$d$ n	7.0	+220				
$d^1$	7.0	+172	+11 39	6 3	127 25	
$d^2$	8.2	+222	+14 48	6 18	127 40	$c^1$
$d^3$	9.5	+169	+12 1	8 6	129 28	$c^3$
$d^4$	10.6	+176	+12 41	8 56	130 18	$c^4$
$d^5$	11.6	+163	+12 9	9 53	131 15	
$d^6$	13.7	+188	+14 3	11 15	132 37	
$e^1$	20.1	- 28	+ 3 9	19 35	140 57	
Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$e$ n	+21.3	+ 35''	+ 6° 3'	20° 49'	142° 11'	$d_1$
$e$ s	23.4	- 5				
$e^2$	25.2	+ 21	+ 7 0	23 6	144 28	$d^1$
$e^3$	26.1	- 8	+ 5 34	24 17	145 39	$d^3$
$e^4$	27.0	- 13	+ 5 24	25 8	146 30	$d^4$
$e^5$	28.2	+ 24	+ 7 49	25 37	146 59	
$e^6$	30.1	- 21	+ 5 42	27 58	149 20	
$e_1^7$	31.9	+ 7	+ 7 40	29 9	150 31	$e^1$
$e_2^7$	32.5	+ 5	+ 7 41	29 43	151 5	$e$
$e^8$	34.1	0	+ 7 44	31 12	152 34	$e^2$
$f_1$	55.8	- 90	+ 7 15	55 36	176 58	$f$
$f_2$	56.1	- 85	+ 7 36	56 2	177 24	
$f^1$	56.7	- 74	+ 8 21	56 40	178 2	$f$
$f^2$	58.4	- 78	+ 8 29	59 8	180 30	$f^2$
$g$ s	65.7	- 97				
$g$ n		- 85	+ 9 16	72 33	193 55	$g$
December 3 2 <sup>h</sup> 15 <sup>m</sup>						
$a$	-56.0	+268	+ 3 30	305 18	81 26	
$b$	20.1	+414	+19 43	338 7	114 15	$a$
$b^1$	16.1	+417	+20 48	341 31	117 39	$a^1$
$c$ n	11.8	+284				
$c$ s	9.4	+261	+13 30	349 18	125 26	$b$
$c^1$	8.5	+282	+14 30	350 50	126 58	$b^1$
$c^2$	8.5	+252	+12 46	351 23	127 31	
$c^3$	7.1	+236	+12 8	352 48	128 56	$b^2$
$c^4$	6.8	+249	+12 58	352 49	128 57	
$c^5$	6.0	+208	+10 47	354 12	130 20	$b^3$
$c^6$	4.0	+199	+10 41	355 55	132 3	
$d_1$ n	+ 4.8	+ 94				
$d_1$ s	6.5	+ 60	+ 5 40	5 26	141 34	$c$
$d_2$	6.8	+ 60	+ 5 5	6 37	142 44	$c^1$
$d^1$	8.8	+ 90	+ 7 12	7 45	143 53	$c^3$
$d^2$	8.8	+ 30	+ 3 48	8 37	144 45	$c^5$
$d^3$	9.4	+ 53	+ 5 4	8 43	144 51	$c^4$
$d^4$	10.4	+ 48	+ 5 9	9 37	145 45	$c^6$
$e^1$	15.5	+ 64	+ 7 8	13 29	149 37	$d$
$e$	16.2	+ 67	+ 7 27	14 0	150 8	$d^1$
$e^2$	18.1	+ 62	+ 7 33	15 35	151 43	$d^3$
$f$	43.8	- 32	+ 7 37	39 55	176 3	$e$
$f^1$	44.5	- 21	+ 8 24	40 29	176 37	$e^1$
$f^2$	47.7	- 32	+ 8 26	44 2	180 10	$e^2$
$g$	57.7	- 62	+ 8 49	56 44	192 52	$f$
$g^1$	58.5	- 85	+ 7 40	58 14	194 22	
$h$	63.0	-376	- 8 7	78 25	214 33	$g^1$
$i$	64.0	-106	+ 7 37	67 56	204 4	$h^1$
$i^1$	64.6	-136	+ 6 1	69 49	205 57	$h$
December 4 0 <sup>h</sup> 13 <sup>m</sup>						
$a$	-30.9	+450	+19 35	326 24	115 22	
$a^1$	27.9	+453	+20 25	329 12	118 10	



## 1861 December 4—Continued

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$b^s$	-24.9	+309"	+13° 25'	336° 29'	125° 27'	a
$b^n$	22.7	+330				
$b^1$	21.8	+323	+14 3	338 7	127 5	
$b^2$	20.5	+279	+11 47	340 13	129 11	
$b^3$	19.1	+259	+10 55	341 45	130 43	
$c^n$	9.2	+141				b
$c^s$	7.5	+109	+ 5 31	352 48	141 46	
$c^1$	7.0	+109	+ 4 53	354 9	143 7	$b_1$
$c^2$	5.6	+114	+ 5 27	355 8	144 6	$b^1$
$c^3$	4.7	+137	+ 6 56	355 29	144 27	
$c^4$	4.7	+100	+ 4 51	356 3	145 1	
$c^5$	4.7	+ 86	+ 4 3	356 16	145 14	
$c^6$	3.6	+100	+ 5 5	356 58	145 56	$b^2$
d	+1.6	+114	+ 6 55	0 46	149 44	c
$d^1$	2.0	+111	+ 6 50	1 10	150 8	
$d^2$	2.6	+118	+ 7 21	1 30	150 28	$c^1$
$d^3$	3.7	+116	+ 7 28	2 23	151 21	$c^2$
e	31.6	+ 16	+ 7 31	26 47	175 45	d
$e^1$	32.1	+ 30	+ 8 25	27 1	175 59	$d^1$
$e^2$	36.9	+ 12	+ 8 23	31 40	180 38	$d^3$
$f^n$	47.7	- 21	+ 8 22	43 35	192 33	e
$f^s$	48.7	- 37				
g	53.3	-337	- 8 4	56 41	205 39	
$g^1$	58.5	-346	- 7 32	65 7	214 5	$g^1$
$g^2$	59.8	-353	- 7 41	67 53	216 51	$g^2$
$g^3$	60.5	-371	- 8 33	70 26	219 24	$g^3$
$g^4$	61.9	-394	- 9 38	75 24	224 22	g
$g^5$	61.9	-376	- 8 35	73 53	222 51	
$h^1$	56.1	- 72	+ 7 32	53 42	202 40	f
h	58.6	-102	+ 6 20	57 37	206 35	$f^1$
$h^2$	58.0	- 58	+ 8 43	56 6	205 4	
$h^3$	58.5	- 67	+ 8 19	56 59	205 57	
$h^4$	60.3	- 93	+ 7 11	60 7	209 5	
$h^5$	60.4	- 63	+ 8 55	59 42	208 40	$f^4$

December 5 0<sup>h</sup> 26<sup>m</sup>

$a^s$	-38.1	+343	+12 52	322 32	125 40	a
$a^n$	36.1	+368				
$a^1$	32.8	+276	+ 9 10	328 39	131 47	
$b^n$	24.4	+186				b
$b^s$	22.8	+154	+ 4 57	338 44	141 52	
$b_1$	22.3	+154	+ 4 19	340 6	143 14	
$b^1$	21.4	+156	+ 4 36	340 48	143 56	
$b^2$	19.6	+142	+ 4 11	342 34	145 42	$b^1$
c	14.0	+157	+ 6 8	346 50	149 58	$b^2$
$c^1$	13.0	+165	+ 6 47	347 30	150 38	
$c^2$	10.5	+165	+ 7 17	349 30	152 38	$b^3$
d	+16.7	+ 63	+ 6 55	12 35	175 43	c
$d^1$	16.7	+ 82	+ 8 0	12 20	175 28	

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$d^2$	+21.5	+ 79"	+ 8° 48'	16° 20'	179° 28'	
$d^3$	22.3	+ 58	+ 7 45	17 16	180 24	
$e^n$	34.2	+ 23				d
$e^s$	36.6	+ 9	+ 7 59	29 12	192 20	
$f^1$	44.9	- 30	+ 7 15	39 0	202 8	e
$f^2$	47.4	- 58	+ 6 10	42 1	205 8	
f	48.9	- 68	+ 5 54	43 51	206 58	$e^4$
$f^3$	48.9	+ 5	+10 4	42 56	206 4	$e^5$
$f^4$	50.8	- 42	+ 7 45	45 35	208 43	
$g^1$	49.7	-320	- 7 43	50 27	213 34	f
$g^2$	52.3	-322	- 7 50	53 46	216 54	
$g^3$	53.7	-341	- 8 40	56 18	219 26	$f^1$
g	56.3	-365	- 9 30	61 15	224 22	$f^4$
h	68.2	- 5	+13 26	74 35	237 42	$g_1 g_2$

December 7 0<sup>h</sup> 14<sup>m</sup>

$a^s$	-56.7	+404	+13 6	295 3	126 8	
$a^n$	55.7	+427				
$b^n$	49.5	+272	+ 5 32	311 8	142 13	
$b^s$	47.9	+249				
$b^1$	46.3	+231	+ 4 18	314 31	145 36	
$b^2$	35.6	+242	+ 6 54	324 57	156 2	a
$b^3$	31.0	+238	+ 7 31	329 13	160 18	
c	13.8	+178	+ 7 19	344 46	175 51	
$d^n$	+ 3.6	+134	+ 7 48	359 55	191 0	$b_1 b_2$
$d^s$	5.3	+120				
$d^1$	6.7	+ 93	+ 6 18	2 15	193 20	
$d^2$	12.6	+132	+ 9 39	6 28	197 33	
$e^1$	16.2	+102	+ 8 36	9 45	200 50	c
e	17.1	+ 83	+ 7 41	10 40	201 46	
$e^2$	20.0	+ 72	+ 7 36	13 12	204 17	
$e^3$	20.7	+ 88	+ 8 39	13 35	204 40	$c^3$
$e^4$	21.7	+ 48	+ 6 34	14 56	206 1	
$e^5$	22.1	+111	+10 15	14 32	205 37	
$e^6$	22.5	+ 35	+ 5 58	15 43	206 48	
f	24.8	-228	- 8 33	21 39	212 44	d
$f^1$	31.5	-245	- 8 14	27 50	218 55	$d^1$
$f^2$	33.8	-269	- 9 11	30 26	221 31	
$f^3$	34.9	-313	-11 30	32 29	223 34	$d^2$
$f^4$	36.8	-278	- 9 7	33 26	224 31	$d^3$
$f^5$	37.4	-290	- 9 42	34 15	225 20	
$f^6$	42.0	-343	-11 52	40 20	231 25	
$g_1$	54.0	+ 59	+13 24	46 28	237 33	$f^1$
$g_2$	54.7	+ 58	+13 29	47 23	238 28	$f^2$

December 10 23<sup>h</sup> 32<sup>m</sup>

a	-63.6	+326	+ 7 43	282 38	155 24	
$b_1$	40.2	+266	+ 7 57	317 10	189 56	$a^1$
$b_2$	39.9	+316	+ 8 10	317 55	190 41	a
$b^1$	39.5	+268	+10 53	316 24	189 10	$a^2$

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1861 December 10—Continued						
<i>c</i>	-29.4	+248"	+ 8° 42'	327° 45'	200° 31'	
<i>c</i> <sup>1</sup>	27.7	+193	+ 5 48	330 12	202 58	
<i>c</i> <sup>2</sup>	26.9	+228	+ 7 57	330 15	203 1	
<i>c</i> <sup>3</sup>	24.3	+230	+ 8 30	332 30	205 16	
<i>d</i>	19.9	- 83	- 8 41	340 17	213 3	
<i>d</i> <sup>1</sup>	13.0	-108	- 8 58	346 10	218 56	
<i>d</i> <sup>2</sup>	8.8	-179	-12 21	350 24	223 10	
<i>d</i> <sup>3</sup>	7.7	-136	- 9 40	350 48	223 34	
<i>e</i>	16.6	+400	+19 51	335 46	208 32	
<i>f</i> <sub>1</sub>	+14.2	+205	+13 37	4 10	236 56	<i>c</i>
<i>f</i> <sub>2</sub>	15.1	+198	+13 23	5 2	237 48	
<i>f</i> <sup>1</sup>	19.5	+205	+14 34	8 36	241 22	
<i>g</i>	67.3	+ 46	+13 57	66 3	298 49	
<i>g</i> <sup>1</sup>	68.3	+ 41	+13 51	68 46	301 32	
December 11 2 <sup>h</sup> 30 <sup>m</sup>						
<i>a</i>	-53.0	+297	+ 7 58	301 10	189 43	<i>a</i>
<i>a</i> <sup>1</sup>	52.0	+302	+ 8 24	302 18	190 51	<i>a</i> <sup>1</sup>
<i>a</i> <sup>2</sup>	51.4	+341	+10 47	301 47	190 20	<i>a</i> <sup>2</sup>
<i>b</i> <sup>4</sup>	40.9	+256	+ 7 27	315 50	204 23	<i>b</i> <sup>4</sup>
<i>c</i>	37.5	+ 29	- 5 3	322 32	211 5	
<i>c</i> <sup>3</sup>	25.2	-100	-10 32	334 44	223 17	
<i>d</i> <sub>1</sub>	3.5	+261	+13 44	348 7	236 40	<i>c</i>
<i>d</i> <sub>2</sub>	2.6	+258	+13 43	348 55	237 28	<i>c</i> <sup>1</sup>
<i>f</i>	+42.3	+141	+14 26	28 51	277 24	
<i>g</i> <sup>1</sup>	57.9	+102	+ 4 56	47 28	296 1	<i>e</i> <sup>1</sup>
<i>g</i>	59.8	+ 93	+14 44	50 22	298 55	<i>e</i>
<i>g</i> <sup>4</sup>	62.8	+ 97	+15 34	55 26	303 59	<i>e</i> <sup>8</sup>
December 12 0 <sup>h</sup> 45 <sup>m</sup>						
<i>a</i>	-60.6	+302	+ 7 29	288 37	190 10	<i>a</i>
<i>a</i> <sup>1</sup>	59.8	+326	+ 8 34	289 25	190 58	<i>a</i> <sup>1</sup> ?
<i>a</i> <sup>2</sup>	58.8	+353	+10 43	289 29	191 2	<i>a</i> <sup>2</sup>
<i>b</i> <sup>1</sup>	54.6	+302	+ 8 18	298 0	199 33	<i>b</i> <sup>1</sup>
<i>b</i> <sup>2</sup>	53.8	+328	+ 9 57	298 18	199 51	
<i>b</i>	53.6	+383	+ 7 21	300 0	201 33	<i>b</i>
<i>b</i> <sup>3</sup>	52.1	+246	+ 5 24	302 50	204 23	<i>b</i> <sup>4</sup>
<i>b</i> <sup>4</sup>	50.9	+260	+ 6 23	303 56	205 29	<i>b</i> <sup>5</sup>
<i>c</i>	17.7	+299	+13 40	335 3	236 36	<i>d</i> <sub>1</sub>
<i>c</i> <sup>1</sup>	16.6	+296	+13 36	336 0	237 33	<i>d</i> <sub>2</sub>
<i>d</i> <sup>1</sup>	+24.0	+167	+12 35	10 53	272 26	
<i>d</i>	28.3	+174	+13 42	14 34	276 7	<i>e</i> <i>e</i> <sup>1</sup>
<i>d</i> <sup>2</sup>	35.0	+169	+14 32	20 44	282 17	<i>e</i> <sup>3</sup>
<i>e</i> <sup>1</sup>	48.3	+121	+13 57	34 29	296 2	<i>f</i> <sup>1</sup>
<i>e</i> <sup>2</sup>	48.7	+ 74	+11 16	35 7	296 40	<i>f</i> <sup>2</sup> ?
<i>e</i>	50.5	+117	+14 6	37 2	298 35	<i>f</i> <sub>1</sub> / <i>f</i> <sub>2</sub>
<i>e</i> <sup>3</sup>	52.0	+ 62	+11 8	38 55	300 28	<i>f</i> <sup>3</sup>
<i>e</i> <sup>4</sup>	51.7	+ 97	+13 9	38 30	300 3	<i>f</i> <sup>4</sup>
December 13 0 <sup>h</sup> 27 <sup>m</sup>						
<i>a</i>	-65.7	+311	+ 7 48	274 47	190 12	
<i>a</i> <sup>1</sup>	65.1	+317	+ 8 12	276 25	191 50	
<i>a</i> <sup>2</sup>	64.3	+356	+10 36	275 39	191 4	
<i>b</i> <sup>1</sup>	62.4	+312	+ 8 12	283 42	199 7	
<i>b</i>	61.5	+306	+ 7 57	285 51	201 16	
<i>b</i> <sup>2</sup>	61.1	+321	+ 8 54	286 3	201 28	<i>a</i>
<i>b</i> <sup>3</sup>	60.4	+295	+ 7 26	288 24	203 49	<i>a</i> <sup>1</sup>
<i>b</i> <sup>4</sup>	60.4	+267	+ 5 49	289 28	204 53	
<i>b</i> <sup>5</sup>	60.0	+279	+ 6 33	289 41	205 6	
<i>b</i> <sup>6</sup>	59.7	+273	+ 6 15	290 32	205 57	
<i>c</i> <sup>1</sup>	53.9	-151	-17 38	303 36	219 1	
<i>c</i>	51.9	-160	-17 53	306 12	221 37	<i>b</i> ?
<i>d</i> <sub>1</sub>	31.9	+337	+13 50	320 57	236 22	<i>c</i>
<i>d</i> <sub>2</sub>	31.0	+334	+13 47	321 50	237 15	<i>c</i> <sup>1</sup>
<i>d</i> <sup>1</sup>	27.4	+349	+15 12	324 48	240 13	
<i>e</i>	+12.1	+222	+13 41	359 31	274 56	<i>d</i>
<i>e</i> <sup>1</sup>	12.6	+227	+14 4	359 51	275 16	<i>d</i> <sup>1</sup>
<i>e</i> <sup>2</sup>	14.2	+233	+14 40	1 10	276 35	
<i>e</i> <sup>3</sup>	20.1	+206	+14 0	6 21	281 46	<i>d</i> <sup>2</sup>
<i>f</i> <sup>1</sup>	35.6	+160	+13 47	20 23	295 48	<i>e</i> <sup>2</sup>
<i>f</i> <sup>2</sup>	35.6	+133	+12 39	20 18	295 43	<i>e</i> <sup>1</sup>
<i>f</i> <sub>1</sub>	37.8	+158	+14 2	22 33	297 58	<i>e</i> <sub>1</sub>
<i>f</i> <sub>2</sub>	38.5	+158	+14 8	23 13	298 38	<i>e</i> <sub>2</sub>
<i>f</i> <sup>3</sup>	38.6	+103	+10 55	23 36	299 1	<i>e</i> <sup>3</sup>
<i>f</i> <sup>4</sup>	39.2	+133	+12 47	24 1	299 26	<i>e</i> <sup>5</sup>
<i>f</i> <sup>5</sup>	39.8	+159	+14 25	24 30	299 55	<i>e</i> <sup>4</sup>
<i>f</i> <sup>6</sup>	40.7	+146	+13 51	25 26	300 51	
<i>f</i> <sup>7</sup>	43.1	+144	+14 4	27 54	303 19	<i>e</i> <sup>7</sup>
<i>f</i> <sup>8</sup>	43.9	+165	+15 27	28 41	304 6	<i>e</i> <sup>8</sup>
<i>g</i>	62.1	+159	+18 17	52 37	328 2	<i>g</i>
<i>h</i>	65.2	+ 89	+14 40	58 1	333 26	<i>h</i>
<i>h</i> <sup>1</sup>	67.6	+119	+16 56	64 20	339 45	<i>h</i> <sup>1</sup> ?
<i>h</i> <sup>2</sup>	60.0	+151	+19 11	70 7	345 32	<i>i</i>
December 14 0 <sup>h</sup> 41 <sup>m</sup>						
<i>a</i>	-65.8	+322	+ 8 52	272 33	202 8	
<i>a</i> <sup>1</sup>	65.4	+297	+ 7 24	276 2	205 37	
<i>b</i>	61.6	- 79	-14 4	291 39	221 14	
<i>c</i>	44.5	+365	+13 55	306 41	236 16	<i>a</i>
<i>c</i> <sup>1</sup>	43.6	+361	+13 48	307 48	237 23	
<i>d</i>	2.6	+271	+14 12	346 9	275 44	} <i>b</i> <sup>1</sup>
<i>d</i> <sup>1</sup>	2.2	+274	+14 26	346 24	275 59	



## 1861 December 14—Continued

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$d^2$	+ 4.0	+ 256"	+ 14° 17'	351° 39'	281° 14'	b
$e^1$	19.8	+ 168	+ 11 29	5 27	295 2	$c^1$
$e^2$	20.1	+ 202	+ 13 31	5 27	295 2	$c^2$
$e_1$	23.1	+ 199	+ 13 47	8 2	297 37	$c$
$e_2$	24.1	+ 199	+ 13 57	8 53	298 28	
$e^3$	25.0	+ 147	+ 11 1	9 59	299 34	
$e^4$	25.7	+ 200	+ 14 14	10 14	299 49	$c^5$
$e^5$	25.9	+ 172	+ 12 37	10 35	300 10	$c^8$
$e^6$	26.8	+ 172	+ 12 46	11 23	300 58	
$e^7$	29.4	+ 200	+ 14 50	13 34	303 9	$c^9$
$e^8$	30.7	+ 205	+ 15 20	14 43	304 18	$c^{10}$
f	40.0	+ 140	+ 12 56	23 46	313 21	d
$f^1$	40.7	+ 130	+ 12 28	24 32	314 7	e
$f^2$	43.2	+ 148	+ 13 56	27 1	316 36	
g	52.7	+ 195	+ 18 20	37 55	327 30	f
h	57.7	+ 116	+ 14 25	44 15	333 50	g
$h^1$	60.7	+ 156	+ 17 21	48 13	337 48	h
i	64.7	+ 170	+ 18 58	56 54	346 29	$h^1$
$i^1$	64.7	+ 110	+ 15 19	56 1	345 36	i
k	64.6	- 348	- 11 2	68 11	357 46	l
l	68.1	+ 200	+ 21 33	67 51	357 26	

December 15 1<sup>h</sup> 10<sup>m</sup>

a	-54.7	+ 384	+ 14 5	292 8	236 2	a
$b^1$	17.9	+ 321	+ 15 0	331 52	275 46	$b^2$
$b^2$	15.4	+ 304	+ 14 20	334 17	278 11	
b	12.7	+ 298	+ 14 20	336 35	280 29	$b^1$
$c^1$	+ 2.4	+ 142	+ 7 15	350 36	294 30	b
$c^2$	3.7	+ 242	+ 13 17	350 37	294 31	
$c^3$	3.7	+ 215	+ 11 42	350 53	294 47	$b^5$
$c^4$	7.4	+ 252	+ 14 20	354 3	297 57	$b^6$
$c^5$	8.6	+ 247	+ 14 20	354 44	298 38	$b^7$
$c^6$	8.3	+ 201	+ 11 31	355 33	299 27	$b^8$
$c^7$	9.8	+ 252	+ 14 45	356 21	300 15	
$c^8$	10.3	+ 202	+ 11 52	356 34	300 28	$b^{10}$
$c^9$	10.8	+ 229	+ 13 32	356 59	300 53	c
$c^{10}$	11.2	+ 219	+ 13 0	359 22	303 16	
d	14.4	+ 247	+ 15 7	0 16	304 10	e
$d^1$	15.5	+ 254	+ 15 42	8 26	312 20	
e	24.6	+ 187	+ 13 2	12 31	316 25	g
f	29.1	+ 173	+ 12 53	23 6	327 0	h
$f^1$	40.4	+ 242	+ 18 46	29 59	333 53	$h^1$
$f^2$	46.9	+ 166	+ 14 47	33 26	337 20	h
g	49.8	+ 212	+ 18 27	36 21	340 15	$i_2$
$g^1$	52.3	+ 182	+ 17 2	41 21	345 15	k
$h^1$	56.2	+ 133	+ 14 45	42 28	346 22	
h	56.8	+ 194	+ 18 31	53 56	357 50	
i	59.9	- 314	- 10 27			

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
k	+ 62.5	- 391"	- 14° 24'	64° 21'	8° 15'	m
l	63.1	+ 232	+ 22 1	53 56	357 50	$l^1$
m	65.1	+ 208	+ 20 54	57 40	1 34	

December 16 0<sup>h</sup> 39<sup>m</sup>

a	-61.3	+ 391	+ 14 13	278 46	236 24	a
$b^1$	11.8	+ 253	+ 11 46	337 3	294 41	$b^1$
$b^2$	11.5	+ 283	+ 13 35	336 57	294 35	$b^2?$
$b^3$	10.4	+ 267	+ 12 46	338 2	295 40	b
b	7.6	+ 285	+ 14 12	340 6	297 44	
$b^4$	6.6	+ 283	+ 14 14	341 0	298 38	$b^3$
$b^5$	6.6	+ 244	+ 11 55	341 27	299 5	$b^5?$
$b^6$	5.5	+ 290	+ 14 47	341 46	299 24	$b^4$
$b^7$	5.2	+ 249	+ 12 23	342 29	300 7	$b^6$
$b^8$	4.0	+ 262	+ 13 19	343 19	300 57	$b^7$
$b^9$	2.4	+ 345	+ 18 31	343 40	301 18	$b^8$
$b^{10}$	0.8	+ 284	+ 15 2	345 41	303 19	
c	+ 7.8	+ 230	+ 12 59	353 13	310 51	c
d	18.9	+ 200	+ 12 45	2 38	320 16	d
e	27.1	+ 278	+ 18 35	9 20	326 58	
f	28.5	- 169	- 7 16	14 12	331 50	e
$f^1$	30.8	- 170	- 7 0	16 18	333 56	$e^1?$
g	34.4	+ 193	+ 14 32	16 19	333 57	f
$h^1$	36.7	+ 262	+ 19 3	18 26	336 4	$g^1?$
h	40.9	+ 226	+ 17 30	22 42	340 20	$g_1 g_2$
$i_1$	46.5	+ 258	+ 20 19	28 49	346 27	$h?$
$i_2$	46.5	+ 233	+ 18 47	28 43	346 21	
$i_3$	46.5	+ 202	+ 16 54	28 36	346 14	$h^1$
$i^1$	48.9	+ 209	+ 17 42	31 21	348 59	i
k	52.1	- 281	- 10 18	40 14	357 52	
l	55.9	+ 258	+ 21 52	41 0	358 38	k
$l^1$	58.5	+ 234	+ 20 50	44 38	2 16	$k^1$
m	57.6	- 370	- 14 39	51 37	9 15	l
n	62.5	+ 311	+ 26 30	54 25	12 3	m
o	68.6	+ 211	+ 21 23	68 21	25 59	n

December 17 0<sup>h</sup> 55<sup>m</sup>

a	-64.7	+ 384	+ 14 2	267 15	239 4	
$b^1$	27.5	+ 301	+ 12 43	322 10	293 59	
$b^2$	27.5	+ 281	+ 11 31	322 29	294 18	
b	22.9	+ 320	+ 14 23	325 54	297 43	
$b^3$	22.1	+ 315	+ 14 10	326 38	298 27	
$b^4$	21.2	+ 320	+ 14 35	327 20	299 9	
$b^5$	20.9	+ 276	+ 12 0	328 18	300 7	
$b^6$	20.0	+ 285	+ 12 38	328 53	300 42	
$b^7$	18.8	+ 296	+ 13 26	329 45	301 34	
$b^8$	16.2	+ 317	+ 15 0	331 39	303 28	
c	9.3	+ 269	+ 12 59	338 1	309 50	
$c^1$	5.2	+ 281	+ 14 13	341 16	313 5	
$c^2$	+ 1.6	+ 242	+ 13 45	347 10	318 59	

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1861 December 17—Continued						
$d$	+11 <sup>s</sup> 6	+317''	+18° 35'	354° 48'	326° 37'	$a^1$
$e$	12.0	-135	- 7 46	358 56	330 45	
$e^1$	16.6	-121	- 6 22	2 32	334 21	
$f$ <sup>n</sup>	19.0	+237	+14 23	2 0	333 49	$a$
$f$ <sup>s</sup>	19.9	+223				
$g^1$	26.0	+285	+18 36	7 30	339 19	
$g_1$	28.0	+251	+16 49	9 23	341 12	
$g_2$	28.4	+249	+16 44	9 46	341 35	
$h$	33.4	+281	+19 24	14 20	346 9	$a^3$
$h^1$	33.4	+244	+17 8	14 21	346 10	
$i$	40.9	-249	-10 29	26 3	357 52	
$i^1$	41.2	-240	- 9 56	26 10	357 59	
$k$	45.3	+288	+21 37	26 49	358 38	
$k^1$	48.1	+267	+20 44	29 51	1 40	
$l$	49.0	-340	-14 37	37 12	9 1	$b$
$m$	55.2	+338	+26 26	40 40	12 29	
$n$	64.1	+240	+21 45	54 18	26 7	$c$
$n^1$	64.8	+226	+21 0	55 27	27 16	
$n^2$	66.1	+224	+21 8	58 45	30 34	
$n^3$	67.6	+197	+19 46	62 25	34 14	
December 22 23 <sup>h</sup> 52 <sup>m</sup>						
$a^1$	-54.0	+408	+17 55	286 6	327 30	
$a$	50.8	+339	+13 49	293 0	334 24	
$a^2$	47.3	+250	+ 8 41	299 6	340 30	
$a^3$	39.9	+397	+18 5	303 54	345 18	
$a^4$	39.9	+454	+21 41	302 17	343 41	
$a^5$	39.6	+237	+ 8 26	307 24	348 48	
$a^6$	38.8	+255	+ 9 34	307 52	349 16	$b$
$a^7$	36.1	+392	+18 3	307 58	349 22	
$b$	19.3	-211	-16 9	328 24	9 48	
$c$ <sup>n</sup>	+ 4.1	+390	+20 53	344 20	25 44	$c$
$c$ <sup>s</sup>	5.2	+370				
$d$	22.1	+338	+20 4	359 39	41 3	
$e$	25.9	-237	-13 22	6 32	47 56	
$f$	39.1	-333	-18 15	14 55	56 19	$D$
$f^1$	42.7	-329	-16 55	24 23	65 47	
$f^1$	44.2	-338	-17 16	26 16	67 40	
December 25 1 <sup>h</sup> 10 <sup>m</sup>						
$a^1$	-69.5	-153	-14 23	258 40	342 54	
$a$	68.4	-144	-13 58	263 45	347 59	
$b$	66.0	+262	+ 9 54	266 18	350 32	
$c^1$	41.6	+392	+18 18	299 40	23 54	
$c$ <sup>s</sup>	39.6	+420				
$c$ <sup>n</sup>	38.5	+438	+20 45	301 27	25 41	$a$
$c^2$	37.5	+404	+19 12	303 50	28 4	
Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$d$ <sup>n</sup>	- 7 <sup>s</sup> 0	-237''	-17° 5'	335° 57'	60° 11'	$b$
$d$ <sup>s</sup>	5.9	-246				
$d^1$	+ 0.9	-269	-18 13	342 10	66 24	
$e^1$	14.9	-342	-21 32	354 48	79 2	$c^2$
$e^2$	15.2	-333	-20 58	354 59	79 13	
$e$	18.5	-363	-22 31	358 16	82 30	$c^3$
$f^1$	56.3	+181	+13 9	32 5	116 19	$e^1?e^2$
$f^2$	58.3	+188	+13 49	35 6	119 20	
$f^3$	59.5	+216	+15 42	37 22	121 36	
$f^4$	60.1	+172	+13 5	37 41	121 55	$e_1$
$f^5$	60.7	+183	+13 50	38 48	123 2	$e_2$
$f$ <sup>n</sup>	61.5	+166				
$f$ <sup>s</sup>		+149	+12 24	39 47	124 1	$e_3$
$g$ <sup>n</sup>	68.1	+ 75				
$g$ <sup>s</sup>		+ 61	+ 8 5	52 30	136 44	$f_2$
December 28 0 <sup>h</sup> 18 <sup>m</sup>						
$a$	-62.6	+407	+20 15	262 43	28 33	
$b$	46.9	-205	-16 34	294 55	60 45	$a$
$b^1$	46.0	-214	-17 5	295 52	61 42	
$c$	32.4	-279	-20 40	309 22	75 12	$b$
$c^1$	30.8	-296	-21 40	310 47	76 37	
$c^2$	27.7	-310	-22 25	313 36	79 26	
$c^3$	23.4	-310	-22 15	317 38	83 28	
$c^4$ <sup>n</sup>	22.5	-308				
$c^4$ <sup>s</sup>		-326	-22 39	318 25	84 15	$c$
$d$	26.9	+259	+11 12	313 28	79 18	
$d^1$	26.0	+273	+12 4	314 5	79 55	
$e^1$	+16.6	+257	+13 11	349 47	115 37	
$e^2$	17.5	+256	+13 11	350 32	116 22	
$e^3$	20.0	+246	+12 44	352 40	118 30	
$e^4$	23.0	+275	+14 42	355 15	121 5	$f^1$
$e^5$	23.5	+207	+10 38	355 42	121 32	$f^3$
$e^6$	25.6	+292	+15 55	357 38	123 28	
$e_1$	24.8	+255	+13 36	356 51	122 41	$f_1$
$e_2$	25.6	+259	+13 54	357 34	123 24	
$e^3$ <sup>n</sup>	26.6	+235				
$e^3$ <sup>s</sup>	27.7	+223	+12 11	358 53	124 43	$f_2$
$f_1$	39.5	+155	+ 8 41	10 14	136 4	
$f_2$ <sup>n</sup>	39.3	+150				
$f_2$ <sup>s</sup>	40.3	+135	+ 7 58	10 31	136 21	$g$
December 30 2 <sup>h</sup> 21 <sup>m</sup>						
$a$	-64.2	-224	-17 44	266 33	61 39	$a$
$b$	55.9	-286	-20 50	279 24	74 30	$b$
$c$ <sup>n</sup>	48.6	-309				
$c$ <sup>s</sup>	47.7	-318	-22 37	289 8	84 14	$c$
$d$	29.2	+314	+14 40	309 0	104 6	
$e$	18.3	+300	+14 2	318 44	113 50	$d^1$
$f^1$	10.6	+305	+14 34	325 16	120 22	$e^2$



## 1861 December 30—Continued

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$f^2$	-10 <sup>s</sup> 3	+245''	+10° 56'	325° 49'	120° 55'	$e^1$
$f^3$	9.6	+238	+10 32	326 23	121 29	$e^3$
$f^4$	7.1	+231	+10 12	328 28	123 34	$e^4$
$f_1^n$	7.7	+296				
$f_1^s$	6.5	+284	+13 27	328 16	123 22	$e_1$
$f_2^n$	6.5	+268				
$f_2^s$	5.1	+254	+12 2	329 26	124 32	$e_2$
$g^n$	+7.3	+199				
$g^s$	8.6	+174	+8 6	340 50	135 56	$f$

December 31 0<sup>h</sup> 55<sup>m</sup>

$a$	-67.6	-249	-17 22	253 46	62 4	
$b$	62.2	-304	-21 14	266 20	74 38	
$c^n$		-317				
$c^s$	56.3	-331	-22 46	276 27	84 45	$a^1$
$d$	33.7	+297	+13 44	304 6	112 24	$b^1?$
$d^1$	32.1	+299	+13 51	305 35	113 53	
$e^1$	25.6	+249	+10 53	311 56	120 14	
$e^2$	25.1	+304	+14 13	311 59	120 17	
$e^3$	24.6	+246	+10 43	312 50	121 8	
$e^4$	23.2	+242	+10 29	314 5	122 23	
$e^n$	22.0	+301				
$e_1^s$	20.9	+283	+13 32	315 15	123 33	$b_1$
$e_2^n$	20.9	+262				
$e_2^s$	19.9	+253	+11 28	316 24	124 42	$b_2$
$f^n$	8.2	+203				
$f^s$	6.8	+182	+7 51	327 26	135 44	$c$
$f^1$	4.3	+157	+7 50	330 6	138 24	
$f^2$	2.1	+212	+9 10	331 46	140 4	$c^1$
$g^1$	+1.7	+210	+9 9	334 51	143 9	$c^2$
$g$	3.2	+200	+8 36	336 5	144 23	$c^3$
$h$	44.6	+177	+9 13	12 43	181 1	$d$

1862 January 2 0<sup>h</sup> 41<sup>m</sup>

$a$	-65.2	-343	-22 16	252 25	88 39	
$a^1$	64.8	-352	-22 52	253 2	89 16	
$b^1$	57.0	+298	+14 48	275 16	111 30	
$b^2$	53.0	+270	+12 51	281 35	117 49	$a^1$
$b^3$	51.0	+282	+13 30	283 59	120 13	
$b^4$	50.7	+259	+12 5	284 45	120 59	$a^2$
$b^5$	50.0	+261	+12 11	285 34	121 48	$a^3$
$b_1$	48.2	+302	+14 35	286 59	123 13	$a$
$b_2$	47.5	+279	+11 51	288 30	124 44	$a^4$
$b^6$	47.7	+236	+10 35	288 33	124 47	
$b^7$	46.0	+295	+14 8	289 38	125 52	$a^5?$
$c^s$	38.7	+190				
$c^n$	37.5	+213	+8 18	298 54	135 8	$b$

$c^1$	-35 <sup>s</sup> 2	+245''	+10° 52'	301° 22'	137° 36'	$b^1$
$c^2$	29.6	+225	+9 37	306 41	142 55	
$c^3$	29.2	+223	+9 29	307 4	143 18	
$d$	+15.3	+214	+9 27	344 12	180 26	
$e$	21.9	+377	+19 39	350 27	186 41	$c$
$e^1$	23.2	+404	+21 25	351 49	188 3	
$f$	42.2	-74	-6 22	8 36	204 50	
$f^1$	43.8	-90	-7 13	10 20	206 34	
$g$	67.9	+250	+15 22	52 23	248 37	$e$

January 3 0<sup>h</sup> 28<sup>m</sup>

$a^1$	-61.6	+246	+12 17	267 59	118 7	
$a^2$	60.2	+239	+11 44	270 40	120 48	
$a^3$	59.5	+241	+11 48	271 51	121 59	$a^1$
$a^n$		+282				
$a^s$	57.4	+257	+13 24	274 26	124 34	$a$
$a^4$	57.4	+229	+10 55	275 18	125 26	$a^2$
$a^5$	56.6	+262	+12 53	275 49	125 57	$a^3$
$b^s$	51.0	+166				
$b^n$	49.9	+189	+7 26	285 6	135 14	$b$
$b^1$	48.4	+236	+10 52	286 52	137 0	
$c$	+6.5	+371	+18 40	336 9	186 17	
$c^1$	7.5	+376	+19 0	336 58	187 6	
$d$	23.0	+216	+9 33	349 51	199 59	$d^1$
$e^1$	59.6	+212	+11 12	29 20	239 28	$e^2$
$e^2$	61.2	+198	+10 31	31 47	240 55	
$e$	63.9	+264	+14 56	38 53	249 1	$e^3$
$e^3$	65.2	+257	+14 42	41 59	252 7	$e^4$
$e^4$	66.8	+228	+13 10	45 23	255 31	$e^5$

January 4 0<sup>h</sup> 31<sup>m</sup>

$a^1$	-66.3	+228	+12 12	256 44	120 56	
$a^2$	64.8	+214	+11 5	261 14	125 26	
$a^s$		+250				
$a^n$	64.3	+275	+14 2	260 48	125 0	
$a^3$	63.7	+250	+13 11	262 39	126 51	
$b^s$	60.8	+150				
$b^n$	59.9	+175	+7 29	270 51	135 3	
$c$	3.8	+225	+9 33	326 44	190 56	$a$
$d$	+5.4	+237	+10 18	334 15	198 27	$a^4$
$d^1$	6.8	+232	+10 0	335 24	199 36	
$e$	48.5	+235	+11 21	13 52	238 4	$c^1c$
$e^1$	52.5	+246	+13 8	22 25	246 37	$d^1d^1$
$e^2$	55.8	+305	+16 9	24 39	248 51	$d^2$
$e^3$	56.3	+284	+14 54	24 53	249 5	$d^4$
$e^4$	58.5	+283	+15 1	28 19	252 31	$d^5?d^6$
$e^5$	59.9	+257	+13 31	29 51	254 3	$d^8$
$e^6$	60.8	+269	+14 23	31 54	256 6	$d^9$
$e^7$	62.3	+289	+15 49	35 34	259 46	$d^{11}$

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1862 January 7 0 <sup>h</sup> 26 <sup>m</sup>						
$a_n$	-47 <sup>s</sup> .1	+187''	+ 8° 30'	285° 1'	191° 16'	
$a_s$		+175				
$a^1$	44.1	+193	+ 9 1	288 9	194 24	
$a^2$	40.9	+189	+ 8 33	291 29	197 44	
$a^3$	39.6	+191	+ 8 36	292 49	199 4	
$a_n$		+228				
$a_s$	38.9	+221	+10 35	293 17	199 32	
$b^1$	41.8	-184	-13 11	289 17	195 32	
$b$	40.9	-182	-13 7	290 14	196 29	
$b^2$	37.9	-205	-14 39	293 0	199 15	
$c^1$	+ 2.0	+265	+11 35	328 50	235 5	
$c$	3.0	+264	+11 30	329 39	235 54	
$d$	14.9	+305	+13 52	339 44	245 59	} a
$d^1$	15.8	+305	+13 53	340 28	246 43	
$d^2$	16.6	+339	+15 58	341 22	247 37	
$d^3$	17.1	+324	+15 2	341 43	247 58	
$d^4$	18.5	+327	+15 12	342 57	249 12	
$d^5$	20.7	+322	+14 55	344 51	251 6	$a^1$
$d^6$	22.9	+324	+15 0	346 48	253 3	$a^2$
$d^7$	24.0	+320	+14 47	347 46	254 1	$a^3$
$d^8$	24.3	+304	+13 49	347 54	254 9	
$d^9$	26.1	+313	+14 23	349 36	255 51	$a^5$
$d^{10}$	27.7	+367	+17 44	351 32	257 47	
$d^{11}$	29.9	+327	+15 16	353 11	259 26	
$e_n$		+347				
$e_s$	40.7	+340	+16 31	4 11	270 26	
$e^1$	43.6	+325	+15 27	6 58	273 13	
$f$	51.6	+260	+11 45	15 21	281 36	} B
$f^1$	52.0	+269	+12 20	16 2	282 17	
$f^2$	53.8	+253	+11 24	18 6	284 22	
$f^3$	55.1	+235	+10 25	21 34	287 49	
$f^4$	56.7	+260	+12 3	22 20	288 35	
$f^5$	57.8	+239	+10 50	23 29	289 44	
January 11 23 <sup>h</sup> 47 <sup>m</sup>						
$a$	-43.3	+265	+14 12	284 46	246 46	
$a^1$	38.3	+290	+15 16	289 50	251 50	
$a^2$	37.0	+297	+15 34	291 6	253 6	
$a^3$	36.1	+292	+15 11	292 2	254 2	
$a^4$	35.2	+324	+17 5	292 42	254 42	
$a^5$	34.8	+290	+14 57	293 19	255 19	
$b_n$		+304				
$b_s$	9.6	+304	+13 6	316 14	278 14	$a_1$
$b^1$	8.5	+274				
$b^2$	5.8	+283	+12 34	318 58	280 58	
$b^3$	+ 1.7	+306	+13 37	325 12	287 12	$a^5$
$b^4$	2.7	+313	+14 0	326 3	288 3	$a^7$
$b_1^4$	5.2	+285	+12 11	328 1	290 1	} $a^8$
$b_2^4$	5.9	+290	+12 27	328 37	290 37	
$c$	48.7	+235	+ 8 29	8 1	330 1	$c$
January 13 23 <sup>h</sup> 45 <sup>m</sup>						
$c^1$	+50 <sup>s</sup> .4	+186''	+ 5° 33'	9° 24'	331° 24'	
$d$	50.8	-163	-14 52	10 0	332 0	$d$
$e$	51.1	+364	+16 30	13 35	335 35	$e$
$e^1$	52.5	+399	+18 49	16 43	338 43	$e^3$
$e^2$	53.0	+374	+17 13	16 34	338 34	$e^4$
$e^3$	53.3	+349	+15 40	16 13	338 13	
January 14 0 <sup>h</sup> 20 <sup>m</sup>						
$a$	-67.5	+184	+11 48	245 19	249 45	
$b_n$		+198				
$b_s$	51.3	+209	+12 10	273 8	277 34	$a$
$b^1$	50.6	+186	+11 1	274 6	278 32	
$b^2$	49.6	+202	+11 50	275 12	279 38	
$b^3$	49.0	+221	+12 55	275 48	280 14	
$b^4$	45.7	+246	+13 59	279 28	283 54	
$b^5$	43.7	+244	+13 35	281 41	286 7	
$b^6$	43.2	+212	+11 36	282 22	286 48	
$b^7$	42.5	+265	+14 46	282 51	287 17	
$b^8$	40.8	+221	+11 52	284 53	289 19	
$c$	8.4	- 46	- 6 47	312 38	317 4	
$c^1$	4.5	- 60	- 7 53	315 48	320 14	
$d^1$	3.0	+246	+ 9 55	318 26	322 52	$b^1 ? b^2$
$d^2$	+ 2.2	+214	+ 7 40	322 30	326 56	
$d$	4.7	+230	+ 8 28	324 41	329 7	$b$



## 1862 January 14—Continued

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$e_1$	+10°.4	-175''	-13° 18'	325° 58'	330° 24'	$b^3$
$e_2$	10.7	-168	-15 9	327 56	332 22	
$f^1$	9.6	+276	+10 56	328 59	333 25	
$f^2$	9.9	+294	+12 1	329 24	333 50	
$f^3$	10.8	+356	+15 46	330 35	335 1	
$f^4$	12.8	+349	+15 13	332 17	336 43	$d$
$f$	14.1	+402	+18 27	333 55	338 21	
$g^{\text{n}}$	54.7	+448	+20 20	20 33	24 59	
$g^{\text{s}}$	55.7	+433				

January 16 2<sup>h</sup> 35<sup>m</sup>

$a$	-66.9	+125	+11 20	244 25	278 14	$a$
$a^1$	66.4	+ 34	+ 5 43	246 39	280 28	
$a^2$	64.2	+ 35	+ 5 11	251 47	285 36	
$b^1$	35.3	+206	+10 39	288 24	322 13	
$b^2$	34.0	+208	+10 36	289 39	323 28	
$b$	28.2	+183	+ 8 29	294 51	328 40	$b$
$b^3$	24.0	+224	+10 26	298 44	332 33	
$b^4$	19.0	+236	+10 38	303 7	336 56	
$b^5$	11.7	+256	+11 7	309 22	343 11	
$c$	+12.6	-270	-21 43	327 0	0 49	
$d^{\text{n}}$	33.7	+459	+20 15	351 55	25 44	$a$
$d^{\text{s}}$	34.6	+447				
$e$	67.3	- 28	- 8 21	32 13	66 2	$b$

January 24 23<sup>h</sup> 54<sup>m</sup>

$a$	-62.1	+244	+20 42	244 53	29 59	$a$
$b$	31.7	-145	- 9 1	280 48	65 54	
$c$	24.5	-267	-17 17	285 16	70 22	
$c^1$	23.3	-267	-17 29	286 22	71 28	
$c^2$	17.4	-286	-19 35	291 19	76 25	
$d^1$	+11.8	+338	+12 43	322 44	107 50	$B$
$d^2$	12.8	+356	+13 42	323 53	108 59	
$d^3$	15.0	+365	+13 59	325 54	111 0	
$d$	17.3	+408	+16 23	328 33	113 39	
$d^4$	18.4	+388	+15 0	329 12	114 18	
$d^5$	21.6	+424	+16 55	332 42	117 48	$d_1, d_2$
$d^6$	27.3	+467	+19 2	339 2	124 8	
$e^{\text{n}}$	56.1	+299	+ 6 29	8 38	153 44	
$e^{\text{s}}$	56.8	+286				
$e^1$	59.6	+292	+ 6 30	14 10	159 16	
$e^2$	60.2	+306	+ 7 25	15 57	161 3	$d^2$
$e^3$	60.8	+317	+ 8 9	17 47	162 53	$d^3$

January 27 23<sup>h</sup> 33<sup>m</sup>

$a$	-60.0	-295	-10 7	238 43	65 14	$a$
$b$	28.5	+276	+15 10	284 58	111 29	

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$b^1$	-28°.1	+289''	+15° 52'	285° 26'	111° 57'	$a$
$b^2$	26.1	+280	+14 56	287 12	113 43	
$b^3$	25.4	+284	+15 2	287 51	115 22	
$c$	6.9	+158	+ 4 20	302 33	129 4	
$d_1^{\text{n}}$	+20.5	+275	+ 6 42	327 6	153 37	
$d_1^{\text{s}}$	21.6	+257				$A$
$d_2$	22.3	+264	+ 6 26	328 7	154 38	
$d^1$	24.0	+270	+ 6 35	329 45	156 16	
$d^2$	27.1	+282	+ 6 56	332 43	159 14	
$d^3$	28.6	+291	+ 7 18	334 11	160 42	
$d^4$	29.1	+305	+ 8 5	334 56	161 27	$c$
$e$	24.4	+131	- 1 36	328 21	154 52	
$e^1$	25.2	+113	- 2 43	328 49	155 20	
$e^2$	27.7	+122	- 2 29	331 9	157 40	
$f$	50.1	+333	+ 8 1	358 8	184 39	
$g$	57.5	+ 34	- 9 59	3 35	190 6	$B$
$g^1$	58.1	+ 46	- 9 18	4 34	191 5	
$g^2$	59.4	- 2	-12 6	6 34	193 5	

January 31 23<sup>h</sup> 53<sup>m</sup>

$a^{\text{s}}$	-38.6	+121	+ 7 57	271 0	153 45	$a^1$
$a^{\text{n}}$	37.3	+102				
$a^1$	32.9	+138	+ 8 19	276 8	158 53	
$a^2$	32.2	+134	+ 7 56	276 45	159 30	
$b^1$	6.0	- 58	- 8 21	296 45	179 30	
$b^2$	3.8	- 28	- 7 3	298 58	181 43	$a^2$
$b_1^3$	+ 3.0	- 67	-10 29	304 5	186 50	
$b_2^3$	3.9	- 67	-10 34	304 47	187 32	
$b_3^3$	4.9	- 68	-10 52	305 39	188 24	
$b^4$	3.4	- 9	- 7 53	306 42	189 27	
$b^5$	8.5	+ 35	- 5 35	309 54	192 39	$a^4$
$b_1$	9.3	- 91	-12 56	309 3	191 48	
$b_2$	10.1	- 88	-12 54	309 46	192 31	
$c$	4.9	+243	+ 8 44	303 25	186 10	

February 5 23<sup>h</sup> 58<sup>m</sup>

$a^1$	-59.0	-284	- 6 26	230 26	183 24	$a$
$a$	56.4	-320	- 9 21	233 30	186 28	
$a^2$	54.7	-233	- 5 22	239 54	192 52	
$a^3$	53.7	-229	- 5 29	241 29	194 27	
$a^4$	52.4	-357	-12 48	238 15	191 13	
$a^5$	50.8	-252	- 7 43	244 45	197 43	$a^1$
$b^{\text{s}}$	36.3	+302	+19 52	269 33	222 31	
$b^{\text{n}}$	35.9	+307				
$b^1$	32.9	+326	+20 19	272 57	225 55	
$b^2$	30.3	+360	+21 45	275 45	228 43	
$c$	24.4	-366	-21 34	269 9	222 7	$b$
$d$	22.1	+304	+16 4	283 0	235 58	
$d^1$	20.0	+302	+15 28	284 48	237 46	
$d^2$	19.3	+326	+16 44	285 41	238 39	$b^2$

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1862 February 5—Continued						
$d^3$	-14.7	+307''	+14° 28'	289° 31'	242° 29'	$c^1$
$e$	+0.3	+452	+20 4	304 29	257 27	
$e^1$	1.4	+480	+21 36	305 58	258 56	$c^2, c^3$
$f^1$	10.9	+346	+11 21	311 38	264 36	
$f$	13.1	+380	+12 58	314 9	267 7	$d$
$f^2$	14.3	+393	+13 32	315 27	268 25	
$g^{\text{n}}$	+526					$e^2$
$g^{\text{s}}$	56.4	+497	+16 21	14 25	327 23	
$g^1$	58.4	+489	+15 10	20 27	333 25	$e$
February 7 0 <sup>h</sup> 37 <sup>m</sup>						
$a$	-57.4	+175	+19 23	240 16	221 40	$a$
$a^1$	52.6	+244	+21 51	247 36	229 0	
$a^2$	52.0	+263	+22 50	248 28	229 52	$b$
$b^1$	48.1	+185	+16 35	253 41	235 5	
$b$	48.1	+173	+15 52	253 57	235 1	$c$
$b^2$	44.4	+192	+15 49	258 5	239 29	
$c$	31.9	+288	+17 54	271 53	253 17	$c^1$
$c^1$	27.9	+338	+19 51	276 11	257 35	
$c^2$	27.0	+365	+21 19	277 17	258 41	$d^1$
$c^3$	26.4	+372	+21 35	277 53	259 17	
$d$	17.8	+254	+12 5	284 17	265 41	$g^1$
$e^1$	+36.2	+410	+10 24	334 39	316 3	
$e^2$	43.1	+523	+16 35	347 3	328 27	$g^2$
$dot(e)$	44.6	+527	+16 41	349 22	330 46	
$c^{\text{n}}$	46.0	+514				$g$
$c^{\text{s}}$	47.3	+500	+15 11	351 16	332 40	
$e^3$	50.1	+498	+14 21	356 14	337 39	$g^3$
$e^4$	50.1	+522	+15 58	357 53	339 17	
$e^5$	51.2	+503	+14 39	358 36	340 0	$g^5$
$e^6$	51.3	+523	+16 0	0 15	341 39	
February 8 3 <sup>h</sup> 3 <sup>m</sup>						
$a$	-63.8	+120	+19 23	225 26	222 18	$a^1$
$b$	57.8	+95	+15 4	238 17	235 9	
$c$	45.6	+210	+17 32	255 44	252 36	$a^1$
$c_1^1$	44.0	+229	+18 11	257 38	254 30	
$c_2^1$	43.5	+231	+18 9	258 13	255 5	$a$
$c_3^1$	43.0	+220	+17 17	258 46	255 38	
$d$	34.8	+231	+15 26	267 26	264 18	$a$
$d^1$	33.4	+180	+12 15	268 19	265 11	
$e$	22.8	+90	+3 56	276 38	273 30	$a^4$
$e^1$	22.3	+139	+6 36	277 48	274 40	
$f$	21.5	+261	+13 31	280 8	277 0	$e^1$
$g^1$	+31.8	+508	+16 52	332 18	329 10	
$g^2$	33.0	+506	+16 33	333 30	330 22	$e_1 e_2$
$g^{\text{n}}$	34.7	+496				
$g^{\text{s}}$	36.2	+484	+15 9	335 32	332 24	
February 11 23 <sup>h</sup> 30 <sup>m</sup>						
$a^1$	-65.4	+46	+16 59	216 51	253 45	$a$
$a^2$	63.1	+25	+14 20	223 57	260 51	
$a^3$	61.5	-51	+9 12	226 36	263 30	$a$
$a^{\text{n}}$	61.1	+32	+13 20	228 32	265 26	
$a^{\text{s}}$		+18				$a$
$a^4$	59.8	+48	+14 4	231 18	268 12	
$b$	53.8	-265	-5 31	233 16	270 10	$a$
$c$	39.5	-507	-23 41	240 28	277 22	
$c^1$	38.4	-509	-24 11	241 42	278 36	$a$
$c^2$	37.2	-476	-22 48	244 52	281 46	
$c^3$	35.9	-478	-23 22	246 13	283 7	$a$
$d$	17.1	+152	+6 6	279 41	316 35	
$e^1$	6.9	+370	+16 14	291 49	328 43	$a$
$e_1^{\text{n}}$	4.3	+374	+14 55	294 17	331 11	
$e_1^{\text{s}}$	3.2	+349				$a$
$e_2$	2.5	+363	+14 42	295 22	332 16	
$e^2$	2.6	+399	+16 55	295 57	332 51	$a$
$e^3$	1.2	+370	+14 47	296 35	333 29	
$e^4$	+1.2	+381	+15 8	297 54	334 48	$a$
$e^5$	3.8	+380	+14 11	300 57	337 51	
$e^6$	4.8	+435	+17 18	302 58	339 52	$a$
$e^7$	6.6	+419	+15 54	304 8	341 2	
$e^8$	7.5	+417	+15 32	304 54	341 48	$a$
$f$	45.7	+598	+20 7	352 46	29 40	
$g$	48.4	+395	+6 39	345 17	22 11	$a$
$g^1$	49.5	+376	+5 22	346 11	23 5	
$g^2$	52.3	+405	+6 54	351 40	28 34	$a$
$h$	54.4	+5	-16 57	345 37	22 31	
$h^1$	56.2	-2	-17 32	348 22	25 16	
February 16 3 <sup>h</sup> 8 <sup>m</sup>						
$a^{\text{n}}$	-61.3	+32	+15 0	222 11	331 22	$c$
$a^{\text{s}}$		+12				
$a^1$	57.8	+77	+16 28	229 36	338 47	$c$
$a^2$	57.4	+68	+15 45	230 12	339 23	
$a^3$	53.5	+75	+14 26	236 21	345 32	$c$
$b$	57.9	-383	-7 53	212 57	322 8	
$c_1$	20.0	+153	+7 14	272 17	21 28	$c$
$c_2$	19.1	+162	+7 29	273 12	22 23	
$c_3$	19.0	+148	+6 40	273 2	22 13	$c$
$c^1$	16.7	+176	+7 33	275 29	24 40	
$c^2$	14.7	+211	+8 57	277 48	26 59	$c$
$c^3$	14.0	+200	+8 8	278 12	27 23	
$d^1$	16.1	+537	+29 40	282 12	31 23	



Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1862 February 16—Continued						
$d^2$	-15.5	+447"	+23° 29'	281° 9'	30° 20'	
$d$	14.0	+426	+21 39	282 7	31 18	
$d^3$	13.1	+440	+22 16	283 10	32 21	
$e_1$	12.3	-204	-14 48	271 36	20 47	
$e_2$	12.0	-204	-14 56	271 57	21 8	
$e^1$	10.7	-218	-16 5	272 41	21 52	
$e^2$	10.4	-176	-13 51	273 56	23 7	
$e^3$	8.2	-183	-14 52	275 38	24 49	
$f^1$	+26.8	+471	+13 36	319 7	68 18	
$f^2$	29.5	+478	+13 26	322 4	71 15	
$f^3$	31.6	+514	+15 14	325 32	74 43	
$f$	32.1	+505	+14 35	325 39	74 50	
$f^4$	32.8	+498	+14 0	326 11	75 22	
$f^5$	33.6	+469	+13 3	325 54	75 5	
March 8 2 <sup>h</sup> 49 <sup>m</sup>						
$a$	-63.5	-35	+19 6	191 34	221 9	
$b^1$	15.8	-211	-12 42	247 23	276 58	
$b^2$	13.7	-223	-14 9	248 47	278 22	
$b$	13.0	-230	-14 49	249 13	278 48	$a_1$
$b^3$	11.1	-242	-16 10	250 25	280 0	$a^2$
$b^4$	9.7	-221	-15 35	252 12	281 47	
$b^5$	9.4	-237	-16 32	251 59	281 34	$a^3$
$b^6$	7.0	-235	-17 21	254 3	283 38	
$c$	+23.0	+540	+14 57	300 36	330 11	$c$
$c^s$	24.4	+524				
$d$	39.6	+658	+18 48	326 53	356 28	$d$
March 9 0 <sup>h</sup> 48 <sup>m</sup>						
$a^1$	-24.4	-337	-15 52	234 53	277 25	$a^1$
$a_1$	24.3	-321	-15 2	235 31	278 3	$a_1$
$a_2$	23.9	-312	-14 44	236 11	278 43	$a_2$
$a^2$	22.9	-332	-16 12	236 22	278 54	$a^2$
$a^3$	20.6	-321	-16 33	238 47	281 19	$a^3$
$b$	+12.3	+484	+14 49	287 56	330 28	$b$
$b^s$	13.7	+464				
$c$	29.2	+453	+10 18	296 17	338 49	
$d$	32.3	+633	+18 43	314 2	356 34	$c_2$
$e$	51.4	+462	+3 53	331 25	13 57	$d^1$
March 11 0 <sup>h</sup> 11 <sup>m</sup>						
$a^1$	-42.7	-483	-14 45	206 47	277 2	
$a_1$	42.0	-474	-14 46	208 17	278 32	$a^1$
$a_2$	41.5	-472	-14 48	209 0	279 15	
$a^2$	40.0	-500	-16 55	209 7	279 22	$a^2?$
$a^3$	38.8	-486	-16 30	211 55	282 10	$a$
Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$b$	-12.9	+331"	+14° 56'	260° 38'	330° 53'	$b$
$b^s$	11.7	+309				
$c_1$	+11.0	+539	+19 18	286 41	356 56	$d_1$
$c_2$	11.6	+537	+18 59	287 5	357 20	$d_2$
$d$	33.1	+422	+5 22	303 1	13 16	
$d^1$	33.1	+398	+3 59	302 9	12 24	
$d^2$	34.1	+434	+5 47	304 33	14 48	$E$
$d^3$	35.4	+393	+3 4	304 23	14 38	
$d^4$	35.7	+429	+5 3	306 5	16 20	
March 13 2 <sup>h</sup> 40 <sup>m</sup>						
$a^1$	-50.2	-585	-14 27	180 9	279 55	
$a^2$	49.3	-612	-15 59	177 38	277 24	
$a$	48.7	-596	-15 59	183 13	282 59	
$a^3$	47.5	-621	-17 46	182 28	282 14	
$b$	38.4	+139				
$b^s$	37.4	+118	+15 2	231 14	331 0	
$b^1$	36.1	+146	+15 12	233 25	333 11	
$b^2$	34.7	+171	+15 58	235 22	335 8	
$c^1$	27.2	+90	+8 0	240 22	340 8	
$c^2$	25.8	+78	+6 59	241 29	341 15	
$c$	23.8	+108	+7 48	243 56	343 22	
$d_1$	14.6	+377	+19 19	258 7	357 53	$a^2$
$d_2$	14.2	+377	+19 8	258 30	358 16	
$e^1$	+6.1	+256	+4 33	272 2	11 48	
$e^2$	6.5	+274	+5 25	272 50	12 36	
$e$	8.0	+286	+5 35	274 21	14 7	
$e^3$	8.2	+269	+4 32	274 6	13 52	
$f_1$	11.8	+563	+20 26	286 25	26 11	$b$
$f_2$	12.3	+553	+19 38	286 28	26 14	$b^1 b^2$
$f^1$	15.7	+576	+19 51	290 27	30 13	
March 18 3 <sup>h</sup> 46 <sup>m</sup>						
$a$	-62.2	-113	+15 49	182 36	353 11	
$a^1$	61.5	-83	+16 50	186 5	356 40	
$a^2$	60.8	-13	+20 9	189 55	0 30	$a$
$a^3$	60.4	-85	+15 54	189 8	359 43	
$b$	47.6	+132	+20 54	215 28	26 3	$b$
$b^1$	46.9	+123	+19 8	215 52	26 27	
$b^2$	46.6	+128	+19 15	216 23	26 58	
$b^3$	44.3	+53	+14 26	217 47	28 22	
$b^4$	43.4	+48	+13 45	218 42	29 17	
$b^5$	42.7	+53	+13 39	219 39	30 14	
$c$	5.6	-81	-9 12	249 10	59 45	$c?$
$c^1$	3.2	-95	-10 50	250 42	61 17	
$c^2$	+1.1	-76	-11 31	254 41	65 16	$c^1$
$d$	30.1	+426	+5 56	293 23	103 58	$e$
$d^1$	31.5	+444	+6 34	295 28	106 3	
$e^1$	40.6	-13	-21 50	292 54	103 29	$f^1$
$e^2$	41.0	+18	-20 12	293 53	104 28	$f^2$

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1862 March 18—Continued						
e	+41 <sup>s</sup> .2	— 7''	—21° 42'	293° 42'	104° 17'	f
e <sup>3</sup>	41.6	— 1	—21 30	294 20	104 55	f <sup>3</sup>
f	41.2	+651	+16 43	319 55	130 30	g
g	51.4	+260	— 9 20	313 19	123 54	h
March 19 0 <sup>h</sup> 16 <sup>m</sup>						
a	—63.5	— 64	+19 45	177 45	0 19	a
b	54.4	+ 53	+19 54	203 16	25 50	
c	15.7	—190	—10 53	236 58	59 32	
c <sup>1</sup>	9.4	—163	—11 59	242 55	65 29	c
d	12.3	+238	+10 38	250 59	73 33	
e	+18.8	+354	+ 5 29	279 44	102 18	
f <sup>1</sup>	30.2	— 66	—21 29	279 39	102 13	c <sup>2</sup> ?
f <sup>2</sup>	30.8	— 48	—20 42	280 47	103 21	c <sup>3</sup> ?
f	32.0	— 71	—22 29	281 32	104 6	d
f <sup>3</sup>	32.3	— 62	—21 48	282 4	104 38	e
g	35.0	+622	+16 12	307 33	130 7	
h	43.6	+224	— 9 28	300 46	123 20	
March 20 0 <sup>h</sup> 34 <sup>m</sup>						
a	—60.1	— 7	+20 13	190 1	26 48	a
b <sup>1</sup>	13.1	—162	—10 24	238 57	75 44	
b	11.2	—169	—11 31	240 16	77 3	
c	+17.9	—144	—21 27	265 24	102 11	a
c <sup>1</sup>	18.4	—114	—19 58	266 33	103 20	
c <sup>2</sup>	19.1	—128	—20 59	266 49	103 36	
c <sup>3</sup>	20.8	—125	—21 29	268 26	105 13	a
d	25.4	+585	+16 48	293 42	130 29	
e	32.6	+173	— 9 6	286 25	123 12	
f	49.3	+598	+11 49	331 19	168 6	
March 25 2 <sup>h</sup> 5 <sup>m</sup>						
a	—30.5	—281	— 8 43	214 58	122 48	a
b	+37.1	+661	+17 50	307 49	215 39	e
March 26 0 <sup>h</sup> 25 <sup>m</sup>						
a	—39.2	—359	— 8 32	202 13	123 7	a
b	7.2	+293	+11 58	249 49	170 43	b <sup>1</sup>
c	1.3	+445	+18 19	259 3	179 57	c
c <sup>1</sup>	1.0	+443	+18 4	259 17	180 11	
c <sup>2</sup>	+ 0.6	+477	+19 27	261 41	182 35	
c <sup>3</sup>	1.2	+465	+18 30	261 46	182 40	
d	18.8	+131	— 6 43	266 43	187 37	d <sup>1</sup>
e	29.7	+625	+17 41	294 53	215 47	d

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
March 27 0 <sup>h</sup> 42 <sup>m</sup>						
a	—46 <sup>s</sup> .6	—435''	— 8° 25'	188° 9'	123° 15'	a
b	21.8	+170	+11 20	233 37	168 43	B
b <sup>1</sup>	20.5	+198	+12 18	235 25	170 31	
c	14.3	+349	+18 11	244 32	179 38	
d	+ 2.8	— 4	— 7 58	249 3	184 9	B
d <sup>1</sup>	5.5	+ 38	— 6 45	252 15	187 21	
d <sup>2</sup>	5.7	+ 79	— 4 39	253 32	188 38	
e	19.6	+565	+17 28	280 32	215 38	
March 28 0 <sup>h</sup> 14 <sup>m</sup>						
a	—51.1	—498	— 8 36	174 24	123 15	b
b <sup>1</sup>	10.8	— 99	— 7 32	234 36	183 27	
b	9.9	— 85	— 7 11	235 46	184 37	
b <sup>2</sup>	7.7	— 71	— 7 20	237 52	186 43	b
b <sup>3</sup>	7.2	— 67	— 7 19	238 23	187 14	
c	+57.3	+225	—13 11	313 22	262 13	
March 29 0 <sup>h</sup> 17 <sup>m</sup>						
a	—34.7	—420	—13 31	201 10	164 5	b
b	+51.1	+217	—12 19	300 45	263 40	
April 4 23 <sup>h</sup> 26 <sup>m</sup>						
a	—28.8	—214	— 5 24	209 9	255 46	a <sup>1</sup>
a <sup>1</sup>	28.0	—191	— 4 35	210 37	257 14	a <sup>2</sup>
a <sup>2</sup>	26.1	—156	— 3 35	213 21	259 58	
a <sup>3</sup>	26.1	—193	— 5 29	212 10	258 47	a <sup>3</sup>
a <sup>4</sup>	24.9	—159	— 4 15	214 17	260 54	
a <sup>5</sup>	23.9	—152	— 4 20	215 24	262 1	b <sub>1</sub> b <sub>2</sub>
a <sup>6</sup>	20.9	—147	— 5 21	218 3	264 40	
b	10.5	—179	—11 24	225 36	272 13	b <sub>1</sub> b <sub>2</sub>
b <sup>1</sup>	9.7	—161	—10 47	226 47	273 24	
b <sup>2</sup>	9.5	—246	—15 21	224 20	270 57	b <sup>1</sup>
b <sup>3</sup>	8.9	—172	—11 42	227 6	273 43	
b <sup>4</sup>	7.4	—156	—11 29	228 47	275 24	b <sup>1</sup>
b <sup>5</sup>	5.7	—110	— 9 45	231 28	278 5	
b <sup>6</sup>	4.9	—150	—12 0	231 4	277 41	b <sup>1</sup>
b <sup>7</sup>	3.9	—145	—12 21	231 57	278 34	
b <sup>8</sup>	0.6	—147	—13 47	234 31	281 8	c
b <sup>9</sup>	+ 0.3	—154	—14 29	235 1	281 38	
c <sup>n</sup>	0.5	+369	+13 7	249 47	296 24	c
c <sup>s</sup>	1.6	+358				
c <sup>1</sup>	1.6	+351	+12 12	249 49	296 26	c <sup>1</sup>
d	9.7	—214	—21 34	241 11	287 48	d d <sup>1</sup>
d <sup>1</sup>	11.4	—189	—20 53	243 20	289 57	
d <sup>2</sup>	12.9	—175	—20 42	245 0	291 37	
d <sup>3</sup>	14.2	—195	—22 19	245 36	292 13	



1862 April 4—Continued

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$d^4$	+14.9	-184"	-22° 3'	246° 31'	293° 8'	
$d^5$	15.4	-193	-22 42	246 43	293 20	$e$
$e$	28.9	+578	+15 12	282 42	329 19	$f$

April 6 0<sup>h</sup> 29<sup>m</sup>

$a$	-47.9	-415	- 6 15	177 49	253 8	$a^2$
$a^1$	47.2	-393	- 5 35	180 5	255 24	$a^1$
$a^2$	45.4	-336	- 3 41	185 31	260 50	
$a^3$	44.5	-341	- 4 24	186 14	261 33	$a$
$b_1$	34.8	-364	-10 11	195 47	271 6	$b$
$b_2$	34.2	-363	-10 25	196 25	271 44	
$b^1$	29.7	-350	-11 50	201 16	276 35	$b^2$
$b^2$	29.1	-368	-13 1	201 5	276 24	$b^3$
$c$	25.4	+168	+13 0	221 0	296 19	$c$
$c^s$	24.5	+159				
$dot(c)$	25.0	+143	+11 54	220 7	295 46	$c^1$
$c^1$	16.5	+273	+15 26	230 57	306 16	
$d$	15.7	-406	-21 2	211 21	286 40	$d$
$d^1$	15.1	-407	-21 21	211 49	287 8	
$e$	7.8	-385	-23 26	218 56	294 15	
$f^1$	+ 4.7	+385	+13 2	251 26	326 45	
$f^s$	5.9	+436				
$f^s$	6.7	+422	+14 55	254 10	329 29	$e$
$f^2$	7.4	+393	+12 25	253 52	329 11	

April 7 0<sup>h</sup> 53<sup>m</sup>

$a^1$	-52.7	-426	- 4 7	168 0	257 35	
$a^2$	52.7	-475	- 6 19	163 31	253 6	
$a$	50.6	-410	- 4 33	172 55	262 30	
$b$	43.0	-444	-10 10	181 44	271 19	$b^1$
$b^1$	39.4	-452	-12 22	185 35	275 10	
$b^2$	38.7	-457	-12 57	186 6	275 41	
$b^3$	38.0	-452	-13 3	187 10	276 45	
$b^4$	36.1	-423	-12 32	190 46	280 21	$b^2$
$b^5$	35.7	-446	-13 51	189 58	279 33	
$b^6$	35.3	-437	-13 35	190 51	280 26	$b$
$b^7$	34.2	-428	-13 41	192 29	282 4	
$c^1$	37.2	+ 46	+12 11	205 48	295 23	$a_1$
$c^s$	37.2	+ 55				
$c^n$	36.2	+ 71	+12 53	206 42	296 17	$a$
$d$	25.5	-495	-21 12	197 29	287 4	$b^3$
$e^n$	7.1	+340				
$e_s$	6.3	+330	+14 50	239 45	329 20	$c$

April 9 1<sup>h</sup> 2<sup>m</sup>

$a^n$	-54.7	-100	+12 51	178 29	296 13	$a$
$a_s$		-112				

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$a_1$	-54.7	-121"	+12° 3'	178° 1'	295° 45'	$a_1$
$b^1$	51.6	-550	-10 7	154 34	272 18	
$b^2$	48.6	-558	-12 27	161 50	279 34	
$b$	47.5	-568	-13 34	163 4	280 48	$b$
$b^3$	40.5	-638	-20 48	168 3	285 47	
$c^s$	31.7	+130				
$c^n$	31.0	+139	+14 27	211 35	329 19	$c$
$d$	+19.2	+145	- 5 23	253 26	11 10	$d$
$d^1$	22.2	+167	- 5 17	256 39	14 23	
$d^2$	28.7	+128	+ 9 42	261 27	19 11	$d^3$
$e^1$	28.4	+477	+ 9 44	272 25	30 9	$F$
$e^2$	29.8	+508	+11 4	275 11	32 55	
$e$	32.3	+530	+11 35	278 38	36 22	

April 10 0<sup>h</sup> 52<sup>m</sup>

$a$	-59.8	-168	+12 38	165 14	296 54	$a$
$a^1$	59.8	-185	+11 45	164 27	296 7	
$b^1$	49.8	-598	-13 11	150 32	282 12	
$b$	49.4	-605	-13 44	150 33	282 13	
$b^2$	48.8	-614	-14 30	150 58	282 38	
$c^s$	42.5	+ 38				
$c^n$	41.8	+ 46	+14 27	197 35	329 15	$b$
$d^1$	+ 5.7	+ 44	- 5 41	238 45	10 25	
$d$	14.1	+ 37	- 9 14	245 22	17 2	$c$
$d^2$	14.5	+ 30	- 9 47	245 34	17 14	$c^1$
$d^3$	17.4	+ 56	- 9 28	248 40	20 20	$c^2$
$dot$	18.3	+ 28	-11 19	248 44	20 24	$c^3$
$d^4$	18.3	+ 44	-10 27	249 8	20 48	
$e$	5.2	+340	+10 36	246 29	18 9	
$e^1$	7.1	+358	+10 51	248 34	20 14	
$f^1$	18.7	+421	+10 3	260 22	32 2	$D$
$f_1$	20.7	+441	+10 34	262 26	34 6	
$f_2$	20.7	+434	+10 4	262 36	34 16	

April 11 0<sup>h</sup> 51<sup>m</sup>

$a$	-62.5	-208	+12 39	152 33	298 15	
$b$	51.1	- 39	+14 30	183 54	329 36	$a$
$c$	0.5	- 64	- 9 1	229 58	15 40	$b$
$c^1$	0.2	- 76	- 9 42	229 53	15 35	$b^1$
$c^2$	+ 4.6	- 44	- 9 52	234 33	20 15	
$c^3$	5.3	- 62	-11 6	234 40	20 22	$b^3$
$d$	4.8	+327	+10 6	244 48	30 30	$c^1$
$d^1$	8.2	+362	+10 45	248 38	34 20	
$d^2$	9.0	+376	+11 14	249 43	35 25	$d$
$d^3$	10.4	+394	+11 43	251 27	37 9	$e^1$

April 12 0<sup>h</sup> 35<sup>m</sup>

$a^n$	-57.7	-103	+14 29	170 28	330 2	$a$
$a_s$		-109				

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date	Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1862 April 12—Continued							April 22 2 <sup>h</sup> 4 <sup>m</sup>						
$b$	-14.50	-170''	-9° 1'	215° 13'	14° 47'	$b^1$	$a$ <sup>n</sup>	-36.4	-335''	-8° 30'	180° 1'	120° 48'	$a$
$b^1$	13.6	-177	-9 32	215 18	14 52	$b^2$	$a$ <sub>s</sub>	-36.4	-347	-8° 30'	180° 1'	120° 48'	$a$
$b^2$	11.1	-135	-8 21	218 34	18 8		$a_1^1$	35.0	-351	-9 21	180 55	121 42	$a^1$
$b^3$	7.7	-158	-10 57	220 37	20 11	$b^4$	$a_2^1$	34.6	-360	-9 59	180 57	121 44	
$c$	9.1	+233	+10 30	230 6	29 40		$b$	22.6	-298	-11 49	194 20	135 7	
$c^1$	8.5	+231	+10 9	230 29	30 3		$b^1$	21.9	-312	-12 49	194 23	135 10	
$d$	4.0	+290	+11 37	235 42	35 16	$c^2$	$c^1$	18.5	-234	-10 5	199 56	140 43	
$e^1$	1.5	+312	+11 51	238 19	37 53	$c^3$	$c^2$	12.1	-213	-11 32	205 47	146 43	
$e$	0.3	+308	+11 8	239 10	38 44	$c$	$c$	11.0	-250	-13 57	205 32	146 19	
$f$	+37.1	+539	+10 47	281 45	81 19	$d$	$c^3$	10.3	-243	-13 51	206 19	147 6	$d$
$g$	54.4	+366	-4 1	298 15	97 49		$d_1$	8.8	+155	+6 55	218 18	159 5	$c$
April 13 0 <sup>h</sup> 44 <sup>m</sup>							$d_2$	8.1	+158	+6 48	218 59	159 46	$c^1$
$a$	-61.8	-159	+14 20	157 13	330 54		$d^1$	2.9	+181	+6 4	223 41	164 28	
$b$	26.3	-267	-8 51	200 48	14 29		$e$	+28.0	+46	-12 28	245 48	186 35	
$b^1$	24.8	-258	-9 0	202 22	16 3		$f$	32.1	+160	-7 37	252 25	193 12	$e$
$b^2$	24.6	-265	-9 28	202 18	15 59		$f^1$	33.7	+192	-6 23	254 46	195 33	
$b^3$	21.9	-260	-10 22	204 47	18 28		$f^2$	34.9	+165	-8 17	255 16	196 3	$e^1?$
$b^4$	20.7	-249	-10 27	206 10	19 51		$g$	60.3	+307	-7 18	298 49	239 36	
$c^1$	18.8	+165	+10 51	219 24	33 5		April 24 0 <sup>h</sup> 5 <sup>m</sup>						
$c^2$	16.2	+204	+11 53	222 35	36 16		$a$	-50.4	-469	-8 26	153 35	121 16	$a$
$c^3$	14.4	+216	+11 49	224 20	38 1		$a^1$	49.7	-484	-9 30	153 37	121 18	$a^1$
$c$	13.4	+212	+11 11	225 2	38 43		$a^2$	47.1	-518	-12 27	155 11	122 52	
$d$	+47.0	+333	-3 44	283 29	97 10		$b$	41.9	-420	-9 58	168 35	136 16	
$d^1$	48.1	+328	-4 33	284 50	98 31		$c$	33.5	-30	+6 53	190 54	158 35	$b$
$e_1$ <sup>n</sup>	60.0	+288	-9 43	306 41	120 22	$b_1$	$c^1$	33.0	-28	+6 47	191 26	159 7	$b^1$
$e_1$ <sub>s</sub>		+279					$d^1$	34.3	-433	-14 1	176 15	143 56	C
$e_2$ <sup>n</sup>		+276					$d^2$	33.6	-425	-13 52	177 17	144 58	
$e_2$ <sub>s</sub>	60.4	+272	-10 19	307 25	121 6	$b_2$	$d$	32.0	-423	-14 27	178 57	146 38	
April 20 2 <sup>h</sup> 53 <sup>m</sup>							$e$ <sup>n</sup>	+5.5	-2	-6 52	223 25	191 6	$d$
$a$	-49.7	-533	-11 59	151 1	64 12		$e$ <sub>s</sub>	6.5	-11				
$b_1$ <sup>n</sup>	13.9	-158	-8 34	208 3	121 14	$a$	$e^1$	10.4	+5	-8 9	227 47	195 28	
$b_1$ <sub>s</sub>	12.9	-172					$e^2$	11.3	-8	-9 1	228 16	195 57	
$b_2$ <sup>n</sup>	12.9	-174	-9 44	208 15	121 26	$a_1^1 a_2^1$	$e^3$	11.7	+5	-8 38	228 51	196 32	$d^1$
$b_2$ <sub>s</sub>	12.2	-188					$f$	51.3	+301	-5 24	276 56	244 37	$e^1$
$b^1$	9.8	-268	-15 30	207 50	121 1		April 25 3 <sup>h</sup> 31 <sup>m</sup>						
$b^2$	7.7	-252	-15 29	210 1	123 12		$a$	-53.5	-516	-9 2	140 15	123 59	
$c^1$	+13.5	-30	-11 38	233 15	146 26	$c^2$	$a^1$	52.7	-529	-10 6	140 53	124 37	
$c_1$	14.3	-78	-14 33	232 43	145 54	c	$b$	45.5	-121	+7 6	175 7	158 51	
$c_2$	14.6	-72	-14 21	233 10	146 21		$b^1$	45.2	-119	+6 49	175 28	159 12	
$c^2$	15.3	-71	-14 44	233 34	146 45		$c$	42.6	-476	-12 37	163 38	147 22	b
$c^3$	16.5	-62	-14 29	234 59	148 10	$c^3$	$c^1$	41.7	-479	-13 9	164 30	148 14	
$d^1$	17.2	+357	+8 8	246 52	160 3		$d$ <sup>n</sup>	10.1	-94	-6 19	208 9	191 53	$c$
$d^2$	17.9	+343	+7 6	247 1	160 12		$d$ <sub>s</sub>	9.0	-107				
$d$	18.5	+336	+6 31	247 15	160 26	$d_1 d_2$	$d^1$	4.2	-103	-8 32	212 21	196 5	$c^5$
$e^1$	23.2	+350	+5 37	251 49	165 0	$c$	$e$	+39.7	+224	-6 3	258 43	242 27	D
$e$	23.8	+356	+5 46	252 30	165 41	$d^1$	$e^1$	41.1	+242	-5 28	206 42	244 26	



Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1862 April 25—Continued						
$f^1$	+55.3	+231"	-9° 55'	279° 48'	263° 32'	
$f^2$	57.0	+199	-12 29	281 41	265 25	$e^2$
$f^3$	58.2	+231	-10 55	285 16	269 0	$e^3$
$f$	59.2	+233	-11 1	287 33	271 17	$e_1 e_2$
April 26 2 <sup>h</sup> 48 <sup>m</sup>						
$a$	-53.5	-113	+10 30	164 17	161 37	
$b$	47.9	-535	-13 9	150 29	147 49	
$c$	22.8	-205	-6 24	194 1	191 21	$a$
$c^1$	21.9	-186	-6 16	195 28	192 48	
$c^2$	21.1	-184	-6 31	196 41	194 1	$a^1$
$c^3$	19.8	-179	-7 10	198 22	195 42	$a^2$
$c^4$	17.9	-177	-7 47	198 23	195 43	$a^3$
$c^5_1$	17.5	-186	-8 41	198 34	195 54	$a^4$
$c^5_2$	16.9	-198	-9 6	198 54	196 14	$a^5$
$d^1$	16.3	-202	-7 19	242 21	239 41	$b$
$d$	+26.7	+120	-7 11	243 12	240 32	$b^1$
$dot$	27.4	+127	-11 25	267 11	264 31	$c$
$e^1$	48.9	+175	-11 33	267 47	265 7	$d^3$
$e^2_1$	49.3	+175	-12 42	267 43	265 3	$d^5$
$e^2_2$	49.6	+156	-10 49	271 28	268 48	$d^7$
$e^3$	50.1	+155	-11 19	273 50	271 10	$d$
$e_1$	50.1	+155	-11 34	274 29	271 49	$e$
$e_2$	51.5	+199	-13 10	297 2	274 22	
$f$	53.1	+198				
$f$	53.5	+196				
$f$	50.4	+597				
April 27 3 <sup>h</sup> 13 <sup>m</sup>						
$a$	-34.6	-286	-6 45	179 17	190 54	
$a^1$	33.9	-299	-6 34	181 26	193 3	
$a^2$	32.6	-276	-8 4	183 46	195 23	
$a^3$	29.8	-283	-9 55	184 3	195 40	
$b^1$	28.5	-308	-7 15	226 58	238 35	
$b^2$	+12.4	+28	-7 29	227 50	239 27	
$b^3$	13.4	+30	-7 48	228 52	240 29	
$b$	14.6	+32	-7 59	230 22	241 59	
$b^4$	16.2	+39	-7 10	231 40	243 17	
$c$	17.2	+60	-14 41	235 54	247 31	
$c^1$	24.5	-30	-14 27	237 6	248 43	
$c^2$	25.6	-19	-16 6	238 43	250 20	
$c^3$	27.7	-35	-16 38	239 8	250 45	
$d^1$	28.3	-41	-12 30	249 27	261 4	
$d^2$	36.2	+81	-12 34	252 53	264 30	$a$
$d^3$	39.2	+97	-13 11	252 38	264 15	
$d^4$	39.2	+86	-11 28	254 0	265 17	
$d^5$	39.7	+120	-13 32	253 8	264 45	
$d^6$	39.7	+83	-13 33	255 46	267 23	
$d^6$	41.9	+95				
May 4 22 <sup>h</sup> 55 <sup>m</sup>						
$a_1$	-43.0	-441	-11 58	156 54	264 14	$a$
$a_2$	42.2	-457	-12 34	157 32	264 52	
$a^1$	41.1	-437	-12 8	159 48	267 8	$a^1$
$a^2$	41.1	-486	-14 44	157 5	264 25	$a^3$
$a^3$	39.8	-448	-13 13	160 40	268 0	$a^4$
$a^4$	38.2	-411	-11 53	164 15	271 35	$a^5$
$a^5$	37.0	-460	-15 1	163 12	270 32	
$a^6_1$	35.5	-431	-14 3	166 12	273 32	
$a^6_2$	34.6	-444	-15 5	166 27	273 47	
$a^7$	34.4	-386	-12 2	169 16	276 36	
$b$	30.3	+99	+12 44	187 10	294 30	$b$
$b^1$	29.9	+128	+14 15	188 6	295 26	$b^1$
$b^2$	28.8	+63	+10 10	187 42	295 2	
$c$	27.1	+329	+25 3	194 43	302 3	
$d$	+3.6	+343	+14 15	221 16	328 36	$c$
$e$	5.6	+445	+19 33	226 0	333 20	$d^1$
$f$	8.9	+477	+20 18	229 52	337 12	$e$
$f^1$	9.3	+470	+19 46	229 55	337 15	
$f^2$	9.7	+488	+20 42	239 54	338 14	
$f^3$	10.5	+513	+21 56	232 34	339 54	
$f^4$	10.7	+500	+21 4	232 14	339 24	$f^?$
$f^5$	11.7	+502	+20 50	233 8	340 28	
$g$	25.6	+556	+19 20	248 5	355 25	$g$
$h$	53.2	+551	+11 18	289 55	37 15	$h$
May 5 2 <sup>h</sup> 57 <sup>m</sup>						
$a$	-50.9	-501	-12 13	140 43	264 27	$a$
$a^1$	49.7	-519	-14 30	139 49	263 33	
$a^2$	49.1	-544	-14 34	144 0	267 44	$a^1$
$a^3$	47.5	-530	-15 11	147 4	270 48	
$a^4$	46.9	-483	-14 47	150 13	273 57	$a^3 a^4$
$a^5$	45.7	-528	-14 36	170 53	294 37	$b$
$a^6$	44.8	-506	+12 50	171 36	295 20	
$b$	44.0	-514	+12 28	172 34	296 18	
$b^1$	43.6	+9	+13 59	204 44	328 28	$c$
$b^2$	43.3	+25	+19 11	207 21	331 5	$d$
$b^3$	42.1	+12	+19 13	207 44	331 28	
$c$	12.0	+239	+19 11	212 3	335 47	
$d$	11.5	+331	+21 25	217 4	340 48	
$d^1$	11.2	+334	+22 0	217 42	341 26	$e^1$
$e$	6.7	+361				
$f$	2.8	+422				
$f^1$	2.5	+434				

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1862 May 5—Continued						
$g^1$	+10 <sup>s</sup> .3	+490''	+21° 12'	229° 50'	353° 34'	
$g$	12.8	+479	+19 17	232 0	355 44	
$h^{\text{n}}$	48.2	+546	+11 35	274 27	38 11	$g$
$h^{\text{s}}$	49.1	+528				
$h^1$	52.0	+524	+10 0	280 20	44 4	$g^3$
$h^2$	54.1	+496	+7 51	282 40	46 24	$g^4$
$h^3$	54.4	+491	+7 29	282 58	46 42	$g^5$
May 6 3 <sup>h</sup> 50 <sup>m</sup>						
$a$	-53.7	-528	-11 40	129 22	267 39	
$a^1$	51.5	-521	-12 24	136 13	274 30	
$a^2$	50.7	-532	-13 21	136 56	275 13	
$a^3$	50.3	-559	-14 56	134 20	272 37	
$a^4$	49.5	-553	-14 58	137 10	275 27	
$b$	53.5	-53	+13 17	156 20	294 37	
$c$	25.6	+154	+14 8	190 20	328 37	$a$
$d$	25.4	+248	+19 33	192 24	330 41	$b$
$d^1$	24.0	+271	+20 23	194 8	332 25	$b^3?$
$e$	19.3	+312	+21 1	199 13	337 30	
$e^1$	15.5	+354	+22 9	203 27	341 44	
$f$	5.3	+353	+18 19	212 0	350 17	$C$
$f^1$	3.2	+387	+19 35	214 40	352 57	
$g^{\text{n}}$	+40.9	+519	+12 7	260 53	39 10	$d$
$g^{\text{s}}$	42.3	+501				
$g^1$	44.0	+494	+10 28	263 9	41 26	$d^1$
$g^2$	44.5	+521	+11 57	265 32	43 49	
$g^3$	45.9	+506	+10 40	266 35	44 52	$d^2$
$g^4$	47.8	+494	+9 26	268 42	46 59	
$g^5$	48.7	+478	+8 15	269 3	47 20	$d^5$
May 8 0 <sup>h</sup> 29 <sup>m</sup>						
$a$	-47.1	+11	+14 6	164 8	328 32	$a$
$b^1$	47.9	+86	+18 44	164 28	328 52	
$b$	47.1	+97	+19 4	165 36	330 0	$b$
$b^2$	46.3	+100	+18 55	166 36	331 0	
$b^3$	43.8	+134	+19 56	170 2	334 26	$b^1$
$c^1$	28.8	+238	+20 17	187 11	351 35	
$c$	28.1	+256	+21 8	188 8	352 32	
$c^2$	27.2	+215	+18 20	188 11	352 35	
$d^{\text{n}}$	+20.9	+398	+11 38	233 46	38 10	$c_1 c_2$
$d^{\text{s}}$	22.8	+382				
$d^1$	24.9	+382	+10 12	236 12	40 36	$c^2$
$d^2$	28.1	+409	+10 46	240 3	44 27	
$d^3$	29.0	+414	+10 44	241 0	45 24	
$d^4$	30.9	+391	+8 51	242 6	46 30	
$d^5$	31.5	+377	+7 52	242 8	46 32	$c^3$
$e$	61.1	+104	-15 57	273 4	77 28	$d$
Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1862 May 10 23 <sup>h</sup> 58 <sup>m</sup>						
$a$	-62 <sup>s</sup> .0	-98''	+13° 43'	136° 44'	328° 54'	$a$
$b$	62.0	-16	+18 25	138 29	330 39	
$b^1$	60.6	+2	+18 51	141 44	333 54	
$c_1^{\text{s}}$	5.4	+221	+11 11	205 32	37 42	$b$
$c_1^{\text{n}}$	3.7	+232				
$c_2^{\text{s}}$	3.7	+229	+11 10	206 37	38 47	$b^1$
$c_2^{\text{n}}$	3.1	+237				
$c^1$	2.3	+268	+12 48	208 20	40 30	$b^2$
$c^2$	1.7	+244	+11 14	208 14	40 24	$b^3$
$c^3$	+5.7	+218	+7 21	213 30	45 40	$b^5$
$d$	45.0	+9	-16 29	244 35	76 45	$c$
$e$	50.8	+218	-6 13	256 26	88 36	$d$
$f$	59.9	+155	-12 10	269 32	101 42	$e$
$g$	64.0	+203	-10 9	283 7	115 17	$f$
May 11 23 <sup>h</sup> 57 <sup>m</sup>						
$a$	-65.4	-117	+14 7	124 13	330 24	
$b^{\text{s}}$	19.2	+142	+11 25	191 44	37 55	$a$
$b^{\text{n}}$	17.0	+156				
$b^1$	16.6	+158	+11 25	193 10	39 21	$a^2$
$b^2$	16.3	+198	+13 36	194 19	40 30	
$b^3$	15.4	+170	+11 40	194 28	40 39	$a^3$
$b^4$	12.3	+156	+9 50	196 43	42 54	$a^4$
$b^5$	9.0	+142	+7 59	199 2	45 13	
$c$	+33.3	-55	-16 23	230 9	76 20	$b$
$d^1$	38.4	+133	-7 14	238 58	85 9	$c$
$d$	40.7	+169	-5 53	242 11	88 22	$c^1$
$e$	52.3	+122	-11 47	254 55	101 6	
$f$	59.5	+186	-9 54	265 41	111 52	$d_1$
$f^1$	60.6	+220	-8 14	272 8	118 19	$d^1$
May 12 2 <sup>h</sup> 26 <sup>m</sup>						
$a^{\text{n}}$	-33.4	+76	+11 46	176 15	37 55	$a$
$a^{\text{s}}$	31.8	+60				
$a^1$	32.1	+129	+15 6	177 51	39 31	
$a^2$	31.0	+76	+11 40	177 53	39 33	$a^1$
$a^3$	30.2	+71	+11 6	178 32	40 12	
$a^4$	26.3	+60	+9 10	181 46	43 26	$a^2 a^3$
$a^5$	25.3	+67	+9 11	182 50	44 30	
$b$	+18.9	-132	-16 6	214 34	76 14	$b_1$
$b^1$	19.7	-133	-16 24	215 14	76 54	$b_2$
$c$	24.8	+71	-6 25	223 48	85 28	$c$
$c^1$	27.5	+99	-5 40	226 48	88 28	
$d_1$	51.0	+144	-9 53	252 34	114 14	$e_1$
$d_2$	51.6	+145	-9 59	253 24	115 4	$e_2$
$d^1$	52.4	+170	-8 45	255 2	116 42	$e^2$
$d^2$	53.5	+174	-8 50	256 47	118 27	$e^3$
$d^3$	54.4	+143	-10 51	257 21	119 1	

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date	Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1862 May 14 0 <sup>h</sup> 25 <sup>m</sup>							May 17 1 <sup>h</sup> 40 <sup>m</sup>						
$a^n$	-53.9	-44''	+12° 9'	149° 3'	37° 28'	$a$	$a$	-65.7	-161''	+10° 6'	116° 18'	47° 42'	
$a_s$	53.1	-60				$a$	$b$	42.3	-490	-16 33	144 9	75 33	
$a^1$	51.7	-46	+11 50	151 35	40 0	$a^1$	$c$	39.7	-332	-8 33	154 27	85 51	
$a^2$	48.7	-55	+10 15	155 10	43 35		$d_1$	14.7	-202	-9 7	180 55	112 19	} $a$
$a^3$	48.4	-60	+9 52	155 26	43 51		$d_2$	14.0	-205	-9 28	181 22	112 46	
$b_1$	7.7	-282	-15 57	187 18	75 43	$c$	$e^1$	4.5	-179	-10 54	189 43	121 7	$a^2$
$b_2$	7.3	-282	-16 5	187 38	76 3		$e^2$	4.2	-165	-10 12	190 17	121 41	$a^3$
$b^1$	3.2	-295	-18 10	190 40	79 5		$e$	2.2	-184	-11 52	191 28	122 52	
$c$	2.4	-79	-6 11	196 29	84 54	$d$	$f$	+1.4	-147	-10 51	195 11	126 35	
$c^1$	2.1	-70	-5 47	196 55	85 20		$f^1$	2.2	-152	-11 22	195 44	127 8	$a^5$
$c^2$	+0.4	-63	-6 9	199 1	87 26	$d^1$	$f^2$	6.9	-115	-10 40	200 19	131 43	
$d$	19.3	-60	-11 46	214 34	102 59		$g$	32.9	+37	-9 33	225 37	157 1	$c^1$
$d^1$	21.5	-23	-10 19	217 8	105 33		$g^1$	36.7	+51	-9 48	229 30	160 54	$c^4$
$e^n$		+39				} $e$	$h$	42.6	+382	+7 29	244 39	176 3	$d$
$e_s$	29.1	+29	-9 21	224 58	113 23		May 20 3 <sup>h</sup> 34 <sup>m</sup>						
$e_2$	29.7	+36	-9 25	225 35	114 0		$a^n$	-48.7	-387	-9 27	138 39	113 15	$a$
$e^1$	30.9	+37	-9 44	226 44	115 9		$a_s$		-394				
$e^2$	32.0	+70	-8 11	228 25	116 50		$a^1$	44.2	-376	-10 3	144 59	119 35	
$e^3$	34.8	+63	-9 23	230 53	119 18		$a^2$	43.1	-374	-10 19	146 5	120 41	} $a^1$
$f$	46.2	+25	-14 49	242 17	130 42	$f$	$a^3$	42.5	-365	-9 58	147 24	122 0	
$f^1$	46.9	+32	-14 37	243 16	131 41	$f^1$	$a^4$	40.2	-380	-11 28	149 23	123 59	
$f^2$	48.7	+38	-14 46	245 33	133 58	$f^2$	$a^5$	37.9	-372	-11 47	152 7	126 43	
$f^3$	51.4	+23	-16 24	248 49	137 14		$b$	22.4	-326	-13 51	168 20	142 56	$b^1$
$g$	57.8	+88	-14 17	259 29	147 54	$g^2 g^1$	$b^1$	20.1	-342	-15 28	169 50	144 26	
$h$	60.8	+74	-15 51	264 54	153 19	$g^2$	$c$	12.8	-199	-9 26	179 47	154 23	$c^1$
May 15 0 <sup>h</sup> 35 <sup>m</sup>							$c^1$	10.9	-192	-9 35	181 28	156 4	$c$
$a^n$	-60.7	-83	+12 13	135 54	38 35		$c^2$	9.2	-190	-9 57	182 53	157 29	
$a_s$		-103					$c^3$	6.5	-162	-9 8	185 42	160 18	$c^2$
$a^1$	59.4	-85	+12 17	138 5	40 46		$c^4$	5.3	-164	-9 35	186 38	161 14	$c^3$
$a^2$	55.6	-80	+11 10	144 25	47 6		$d$	+3.7	+185	+7 40	200 58	175 34	$d$
$a^3$	54.9	-103	+9 36	144 59	47 40	$a$	May 22 2 <sup>h</sup> 29 <sup>m</sup>						
$a^4$	53.9	-76	+10 45	147 4	49 45		$a$	-58.5	-441	-9 30	113 58	116 0	
$b$	24.4	-432	-19 4	167 17	69 58		$a^1$	57.1	-434	-9 39	119 22	121 24	
$b^1$	21.3	-438	-20 27	169 52	72 33		$b$	45.2	-413	-12 14	140 31	142 33	
$c$	20.7	-365	-16 26	172 58	75 39	$b$	$b^1$	44.0	-427	-13 22	141 15	143 17	
$d$	17.0	-164	-6 19	181 50	84 31		$c^1$	39.1	-333	-9 29	150 37	152 39	
$d^1$	14.0	-147	-6 18	184 39	87 20		$c$	36.3	-318	-9 27	154 2	156 4	$a$
$d^2$	13.4	-150	-6 39	185 4	87 45		$c^2$	34.1	-301	-9 7	156 40	158 42	
$e^n$	+14.8	-41				} $d_1 d_2$	$c^3$	32.2	-299	-9 34	158 35	160 37	
$e_s$	16.1	-32	-9 6	210 51	113 32		$d$	24.5	+48	+7 57	173 15	175 17	$b$
$f$	34.3	-41	-14 56	227 30	130 11		$e$	2.3	-202	-12 27	186 30	188 32	
$f^1$	35.6	-27	-14 31	229 4	131 45		$e^1$	0.6	-212	-13 30	187 40	189 42	
$f^2$	38.2	-20	-14 53	231 48	134 29		$f^1$	+57.5	+65	-12 53	250 3	252 5	$e^4$
$g$	48.7	+46	-14 1	244 36	147 17		$f_s$	60.8	+75	-13 22	255 55	257 57	$e$
$g^1$	49.7	+44	-14 23	245 49	148 30								
$g^2$	53.3	+51	-14 59	250 51	153 32								
$h$	57.0	+456	+7 41	275 25	178 6	$h$							



Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1862 May 22—Continued						
$f_s^n$	+61.51	+ 49''	-15° 22'	256° 13'	258° 15'	$e^7$
$f_s^3$	65.0	+ 58	-15 0	265 54	267 56	$g^1$
$f_s^4$	65.5	+ 70	-14 24	267 55	269 57	$g^{2,3}$
$f_s^5$	65.9	+ 35	-16 33	268 50	270 52	$g$
May 24 0 <sup>b</sup> 40 <sup>m</sup>						
$a$	-54.4	-399	- 9 5	126 10	155 13	
$b$	48.3	- 68	+ 7 54	145 50	174 53	
$c$	5.1	+406	+23 56	194 25	223 28	
$c^1$	2.2	+413	+23 37	197 6	226 9	
$d$	+ 3.8	-123	- 8 49	190 37	219 40	
$e^1$	33.3	+ 23	- 8 37	219 3	248 6	$a^1$
$e^2$	36.4	- 32	-11 34	221 26	250 29	$a^3$
$e^3$	38.5	- 46	-13 58	223 5	252 8	$a^4$
$e^4$	38.8	- 26	-12 52	223 40	252 43	
$e^5$	41.0	- 30	-13 39	225 50	254 53	$a^5$
$e^6$	41.5	- 5	-12 19	226 45	255 48	$a^6$
$e^7$	42.5	- 51	-15 17	227 13	256 16	
$e$	42.8	- 9	-12 53	228 5	257 8	$a^9$
$e^8$	42.8	- 75	-16 47	227 16	256 19	
$e^9$	44.1	- 12	-13 24	229 28	258 31	
$e^{10}$	44.8	- 46	-15 34	229 50	258 53	$a^{11}, a^{12}$
$f^1$	46.8	+579	+20 40	254 48	283 51	$d^1$
$f^2$	47.3	+600	+21 53	258 5	287 8	$d^2$
$f$	47.7	+580	+20 32	256 36	285 39	$d$
$g^1$	50.6	- 23	-15 41	237 5	266 8	
$g^2$	53.5	- 12	-15 46	241 4	270 7	$c^1$
$g$	54.3	- 31	-17 4	241 58	271 1	$c$
May 26 23 <sup>h</sup> 59 <sup>m</sup>						
$a^1$	+ 5.8	-102	- 8 24	191 28	248 11	$a^1$
$a^2$	6.6	-164	-12 12	191 0	247 43	$a^2$
$a^3$	9.9	-162	-12 56	193 45	250 28	
$a^4$	12.2	-148	-12 43	195 57	252 40	$a^3$
$a^5$	13.8	-144	-12 53	197 16	253 59	$a^4$
$a^6$	14.2	-130	-12 11	197 56	254 39	$a^5$
$a$	15.0	-144	-13 11	198 20	255 3	
$a^7$	15.0	-199	-13 14	195 31	252 14	
$a^8$	16.0	-167	-13 48	198 45	255 28	$a^6$
$a^9$	17.3	-130	-12 57	200 30	257 13	
$a^{10}$	17.8	-171	-15 30	200 19	257 2	
$a^{11}$	19.7	-176	-16 18	201 54	258 37	
$a^{12}$	20.5	-171	-16 12	202 40	259 23	
$a^{13}$	22.6	-137	-14 43	204 59	261 42	
$b^1$	22.2	+400	+16 35	215 44	272 27	
$b$	23.9	+334	+12 13	215 22	272 5	
Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$b^2$	+29.8	+304''	+ 8° 59'	219° 54'	276° 37'	
$c^1$	31.0	-120	-15 51	212 53	269 36	
$c$	32.9	-134	-17 10	214 29	271 12	$b$
$c^2$	35.5	-155	-19 6	216 54	273 37	
$d^1$	29.9	+510	+21 20	227 5	283 48	$c^1$
$d$	31.2	+508	+20 53	228 17	285 0	$c_1$
$d^2$	31.8	+528	+21 57	229 53	286 36	$c^2$
$d^3$	31.8	+494	+19 50	228 19	285 2	$c_2$
$d^4$	32.7	+541	+22 33	231 30	288 13	
$d^5$	33.8	+533	+21 46	232 14	288 57	
$d^6$	35.0	+555	+22 51	234 45	291 28	$c^4$
$e$	53.4	+404	+ 9 12	251 0	307 43	$E$
$e^1$	54.8	+400	+ 8 38	253 20	310 3	
$e^2$	55.7	+411	+ 9 6	255 40	312 23	
May 28 2 <sup>h</sup> 7 <sup>m</sup>						
$a^1$	-25.6	-255	- 9 16	160 33	246 35	$a^1$
$a^2$	22.8	-293	-12 11	162 5	248 7	
$a^3$	18.8	-270	-11 50	166 4	252 6	$a$
$a^4$	17.8	-264	-11 44	167 6	253 8	
$a^5$	16.3	-246	-11 4	168 47	254 49	
$a^6$	13.9	-287	-14 4	169 50	255 52	$a^3$
$a$	12.1	-228	-11 3	172 38	258 40	$a^5$
$b$	+ 4.1	-257	-16 48	185 28	271 30	$b$
$b^1$	6.7	-214	-14 53	188 22	274 24	
$c^1$	4.1	+402	+21 52	197 45	283 47	
$c_1$	5.3	+400	+21 26	198 44	284 46	$c$
$c_2$	6.4	+402	+21 16	199 46	285 48	
$c^2$	7.0	+407	+21 25	200 24	286 26	$c^1$
$c^3$	9.1	+447	+23 23	203 18	289 20	
$c^4$	11.5	+458	+23 27	205 44	291 46	$c^4$
$d$	22.5	+321	+12 21	211 37	297 39	
$e^1$	30.6	+289	+ 8 32	218 7	304 9	
$e^n$	30.9	+262	+ 7 5	218 18	304 20	$d$
$e_s$	32.0	+253				
$e^2$	31.8	+313	+ 9 39	219 53	305 55	
$e^3$	32.8	+277	+ 7 19	219 48	305 50	
$e^4$	35.4	+326	+ 9 35	223 41	309 43	$d^3$
$f^n$	65.5	+186	- 5 42	264 50	350 52	$e$
$f_s$		+173				
May 30 22 <sup>h</sup> 43 <sup>m</sup>						
$a^1$	-43.9	-341	- 9 59	138 21	250 28	
$a$	41.9	-364	-11 49	139 47	251 54	
$a^2$	39.6	-400	-14 34	141 14	253 21	
$a^3$	37.8	-397	-14 48	143 4	255 11	
$a^4$	36.8	-323	-10 40	146 33	258 40	
$a^5$	36.5	-325	-10 52	146 50	258 57	
$a^6$	34.6	-369	-13 54	147 17	259 24	

1862 May 30—Continued

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
$b$	-21.7	-368"	-17° 0'	159° 27'	271° 34'	
$c$	20.0	+295	+21 34	172 52	284 59	
$c^1$	18.6	+307	+21 57	174 20	286 27	
$c^2$	17.7	+313	+22 7	175 8	287 15	
$c^3$	17.0	+320	+22 22	175 55	288 2	
$c^4$	13.4	+348	+23 14	179 29	291 36	
$d$	+3.8	+116	+5 2	190 28	302 35	$b$
$d^1$	5.2	+148	+6 32	192 16	304 23	
$d^2$	6.0	+203	+9 0	195 50	307 57	
$d^3$	9.2	+210	+9 14	196 38	308 45	
$d^4$	10.0	+220	+9 22	198 24	310 31	
$e$	11.9	+134	-5 48	238 11	350 18	$d$
$e^1$	53.8	+114	-6 41	239 56	352 3	$d^1$
$e^2$	54.7	+114	-8 0	240 14	352 21	
$f^1$	55.6	+430	+11 21	257 56	10 3	$e^2$
$f$	56.1	+405	+9 43	257 12	9 19	$e$
$f^2$	57.8	+407	+9 37	260 26	12 33	

June 5 23<sup>h</sup> 43<sup>m</sup>

$a$	-67.3	-39	+11 11	100 28	297 22	
$b$	65.3	-138	+4 58	104 46	301 40	
$c^1$	34.8	-101	+1 6	148 5	344 59	$a$
$c$	33.6	-83	+1 54	149 30	346 24	$a^1$
$c^2$	32.6	-85	+1 36	150 24	347 18	$a^2$
$c^3$	28.4	-60	+2 13	154 38	351 32	$a^3$
$d$	29.1	-189	-5 41	152 12	349 6	$b$
$d^1$	28.0	-202	-6 43	154 12	351 6	
$e^1$	26.1	+196	+14 18	171 2	7 56	
$e$	13.2	+145	+10 28	171 9	8 3	$c$
$e^2$	12.8	+126	+11 59	173 16	10 10	
$e^3$	11.5	+169	+11 51	174 5	10 59	$c^1$
$e^4$	10.1	+161	+10 2	177 40	14 34	
$e^5$	9.2	+154	+9 49	178 35	15 29	
$f^1$	8.8	+234	+10 47	195 22	32 16	
$f^2$	4.6	+271	+12 47	196 56	33 50	
$f$	3.5	+216	+8 50	196 52	33 46	$d$
$f^3$	+15.3	+250	+10 56	199 0	35 54	$d^4$
$f^4$	16.3	+207	+8 5	199 31	36 25	$d^5$
$f^5$	16.8	+182	+6 37	199 4	35 58	$d^6$
$f^6$	18.4	+277	+11 38	203 29	40 23	
$f^7$	19.2	+317	+13 21	207 24	44 18	

$g^1$	+50.3	+214"	+2° 35'	229° 3'	65° 57'	$g$
$g$	52.2	+223	+2 44	231 43	68 37	
$g^2$	52.8	+230	+3 2	232 43	69 37	

June 8 0<sup>h</sup> 28<sup>m</sup>

$a$	-64.2	-195	+0 18	103 31	342 57	
$a^1$	63.6	-179	+1 9	105 41	345 7	
$a^2$	61.6	-184	+0 35	110 1	349 27	
$a^3$	61.2	-161	+1 49	111 28	350 54	
$b$	59.9	-290	-6 27	109 1	348 27	
$c$	53.0	+21	+10 21	127 56	7 22	
$c^1$	52.1	+2	+11 27	131 49	11 15	
$c^2$	49.1	+37	+10 34	132 48	12 14	
$c^3$	48.2	+74	+13 25	133 41	13 8	
$c^4$	47.7	+78	+13 17	136 8	15 34	
$d^1$	45.6	+62	+9 48	150 20	29 46	
$d^2$	31.5	+69	+9 48	152 26	31 52	
$d$	28.4	+62	+8 37	153 46	33 12	
$d^3$	27.0	+74	+9 33	155 17	34 43	
$d^4$	26.2	+99	+10 38	156 50	36 16	
$d^5$	25.3	+55	+8 5	156 45	36 11	
$d^6$	24.3	+23	+6 8	156 42	36 8	
$d^7$	24.0	+104	+10 38	158 57	38 23	
$d^8$	22.4	+110	+10 18	162 23	41 49	
$e^1$	18.5	-243	-9 27	152 18	31 44	
$e^2$	24.5	-248	-10 6	153 53	33 19	
$e$	22.6	-218	-8 31	155 23	34 49	
$e^3$	21.5	-232	-9 59	158 11	37 37	
$f$	17.9	-284	-17 27	176 57	56 23	
$f^1$	+5.4	-288	-17 54	177 53	57 19	
$f^2$	6.5	-288	-18 7	178 47	58 13	
$f^3$	7.6	-284	-18 39	181 37	61 3	
$f^4$	10.8	-258	-17 8	183 20	62 46	
$g$	12.1	+87	+3 37	186 15	65 41	
$h^1$	12.8	+195	+7 56	197 18	76 44	
$h^2$	10.8	+209	+8 39	197 53	77 19	
$h^3$	22.0	+202	+7 59	199 8	78 34	
$h^4$	23.9	+218	+8 47	200 10	79 36	
$h$	24.8	+220	+8 50	200 31	79 57	
$i$	25.1	-5	-9 33	229 25	108 51	

June 20 23<sup>h</sup> 44<sup>m</sup>

$a$	-44.6	-442	-20 56	116 31	163 56	
$a^1$	44.1	-449	-21 26	116 51	164 16	
$a^2$	41.9	-476	-23 25	118 28	165 53	$a$

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1862 June 20—Continued						
$a^3$	-40 <sup>s</sup> .1	-444''	-21° 28'	121° 59'	169° 24'	$a^1$
$a^4$	38.9	-480	-23 57	122 0	169 25	
$a^5$	36.4	-467	-23 18	125 24	172 49	$a^2$
$a^6$	31.9	-514	-26 55	128 44	176 9	
$a^7$	31.6	-483	-24 50	130 7	177 32	$a^3?$
$a^8$	31.2	-523	-27 37	129 10	176 35	$a^4$
$b^1$	37.7	-292	-12 1	128 36	176 1	
$b$	33.2	-262	-10 34	133 38	181 3	
$c$	11.4	-190	-8 19	154 0	201 25	$b$
$c^1$	9.0	-192	-8 42	156 0	203 25	$b^1$
$d^{\text{ns}}$	1.1	-51	-1 30	164 0	211 25	$c$
$d^1$	+1.8	-56	-1 39	165 58	213 23	
$d^2$	4.9	-72	-2 57	168 26	215 51	
$d^3$	6.9	-53	-2 2	170 11	217 36	$c^3$
$d^4$	8.6	-72	-3 21	171 29	218 54	$c^4$
$e$	7.5	-188	-10 11	169 29	216 54	$d^2$
$f$	25.5	-123	-8 20	185 33	232 58	$f$
$f^1$	27.2	-128	-8 52	187 6	234 31	
$f^2$	28.0	-125	-8 46	187 50	235 16	
$f^3$	29.2	-132	-9 36	188 47	236 12	
$f^4$	32.4	-160	-11 26	191 45	239 10	$f^5?$
$g^1$	64.5	+248	+8 25	240 57	288 22	$h^1$
$g^2$	65.5	+262	+9 0	247 12	294 37	$h^2$
$g$	66.5	+218	+6 11	247 21	294 46	$h$
June 22 1 <sup>h</sup> 4 <sup>m</sup>						
$a$	-57.9	-459	-22 4	89 44	166 1	
$a^1$	56.8	-446	-21 11	94 5	170 22	
$a^2$	54.1	-477	-23 20	97 38	173 55	
$a^3$	52.1	-484	-23 52	101 3	177 20	
$a^4$	50.0	-524	-26 45	102 0	178 17	
$b$	42.0	-204	-6 38	123 50	200 7	
$b^1$	40.7	-207	-6 55	125 10	201 27	
$c^{\text{ns}}$	35.4	-77	-0 7	132 3	208 20	$a$
$c^1$	34.8	-98	-0 6	134 33	210 50	
$c^2$	32.5	-84	+0 4	136 16	212 33	
$c^3$	30.7	-79	+0 31	138 22	214 39	
$c^4$	28.2	-102	-1 9	141 7	217 24	
$c^5$	24.9	-125	-3 16	141 47	218 4	$a^1$
$d$	24.5	-93	-9 7	135 20	211 37	
$d^1$	30.1	-230	-9 5	138 29	214 46	
$d^2$	26.9	-209	-9 54	139 31	215 48	
$e^1$	25.4	-237	+17 34	152 9	228 26	
$e$	14.5	+233	+16 30	156 19	232 36	
$f$	9.7	+223	-7 33	156 1	232 18	$b$
$f^1$	7.0	-172	-7 58	157 3	233 20	
$f^2$	5.7	-177	-7 23	157 56	234 13	
$f^3$	4.8	-165	-6 30	159 16	235 33	
	3.3	-149				
Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
$f^4$	-0 <sup>s</sup> .1	-177''	-8° 30'	161° 45'	238° 2'	
$f^5$	+1.0	-207	-10 26	162 25	238 42	
$g$	27.4	-260	-16 26	185 2	261 19	
$h^1$	49.3	+200	+8 47	210 50	287 7	$c$
$h^2$	53.4	+214	+9 5	216 27	292 44	
$h^{\text{ns}}$	55.1	+172	+6 6	217 42	294 0	$e$
$i^1$	53.7	+163	-7 29	213 24	289 41	$d^1$
$i$	56.0	-63	-12 19	216 48	293 5	$d^2$
$i^2$	58.9	-137	-9 45	221 6	297 23	$d^3?$
$k^{\text{ns}}$	59.0	-88	+9 58	225 55	302 12	$f$
$k^1$	60.2	+251	+10 33	228 41	304 58	$f^2? f^3$
$k^2$	61.8	+233	+11 14	233 1	309 18	$f^4$
$k^3$	62.6	+271	+8 54	233 5	309 22	$f^5$
$k^4$	63.1	+242	+12 31	238 12	314 29	$g$
		+226				
		+297				
June 26 21 <sup>h</sup> 48 <sup>m</sup>						
$a$	-67.5	-86	-0 3	79 46	210 15	
$a^1$	65.3	-95	-0 25	87 11	217 40	
$b$	57.0	-215	-7 40	101 12	231 41	
$c_1$	6.3	+105	+9 18	154 36	285 5	
$c^1$	5.9	+189	+14 23	155 18	285 47	
$c_2$	5.6	+108	+9 26	155 12	285 41	
$c^2$	1.5	+133	+10 40	158 46	289 15	
$d$	0.7	-147	-6 13	158 2	288 31	
$d^1$	+4.8	-175	-8 19	162 28	292 57	
$d^2$	5.0	-222	-11 13	162 26	292 55	
$d^3$	5.7	-196	-9 40	163 5	293 34	
$e^{\text{ns}}$	3.2	+91	+7 26	162 27	292 56	$a$
$f$	11.3	+79	+9 26	169 30	299 59	$b$
$f^1$	14.0	+128	+10 5	171 52	302 21	$b^1$
$f^2$	16.2	+142	+10 37	173 54	304 23	
$f^3$	17.2	+154	+10 58	174 49	305 18	
$f^4$	20.3	+161	+11 42	177 41	308 10	
$f^5$	21.1	+177	+9 26	178 31	309 0	$b^6$
$g^1$	22.2	+152	+15 43	185 42	316 11	
$g$	28.1	+131	+13 25	185 37	316 6	
$g^2$	29.7	+254	+13 53	186 46	317 15	$e?$
$h$	28.6	+217	+15 9	190 23	320 52	
$h^1$	33.0	+226	+16 1	193 16	323 45	
$i$	36.1	+238	-6 9	211 39	342 8	$d$
$k$	54.9	-65	+12 25	233 33	4 2	
	63.4	+266				
June 29 0 <sup>h</sup> 4 <sup>m</sup>						
$a^{\text{ns}}$	-42.1	+44	+6 38	118 48	292 43	$a$
		+32				



1862 June 29—Continued

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$a^1$	-39.9	+ 48''	+ 7° 12'	121° 8'	295° 3'	
$b$	33.2	+ 67	+ 8 12	127 45	301 40	$b$
$b^1$	32.5	+ 81	+ 9 1	128 24	302 19	
$b^2$	31.9	+118	+11 15	128 52	302 47	$b^2$
$b^3$	31.9	+155	+13 30	128 45	302 40	
$b^4$	30.7	+ 51	+ 7 10	130 5	304 0	
$b^5$	28.5	+157	+13 31	132 2	305 57	$b^3$
$b^6$	26.4	+ 91	+ 9 4	134 37	308 32	$b^5$
$b^6_s$	25.1	+ 79				
$b^7$	25.8	+125	+11 30	134 32	308 27	$b^4$
$c$	13.4	+174	+14 2	145 33	319 28	
$d$	+13.6	-141	- 6 19	167 16	341 11	$c_1c_2$
$e^1$	38.6	-334	-20 9	191 21	5 16	$d_1$
$e^2$	39.7	-318	-19 12	192 16	6 11	$d_2$
$e$	42.1	-359	-22 7	195 43	9 38	$d^5$
$e^3$	42.9	-323	-20 26	195 42	9 37	
$f^1$	50.0	+171	+ 9 50	203 32	17 27	$e^1$
$f^2$	50.5	+187	+10 45	205 28	19 23	
$f_1$	51.7	+174	+ 9 50	206 46	20 41	} $e$
$f_2$	52.4	+170	+ 9 32	207 37	21 32	

July 1 0<sup>h</sup> 25<sup>m</sup>

$a$	-61.5	+ 49	+ 7 26	90 54	293 6	
$b$	55.7	+ 68	+ 8 20	100 12	302 24	$a$
$b^1$	55.4	+ 42	+ 6 21	100 47	302 59	
$b^2$	55.2	+114	+10 42	100 30	302 42	$a^1$
$b^3$	52.1	+163	+13 44	104 14	306 26	
$b^4$	51.2	+116	+10 54	105 57	308 9	
$b^5$	51.2	+ 82	+ 8 51	106 13	308 25	} $a^{2,3}$
$b^5_s$	50.4	+ 84	+ 8 58	107 9	309 21	
$c_1$	18.6	-165	- 6 18	138 22	340 34	$b$
$c_2$	18.1	-160	- 6 0	138 50	341 2	
$d$	+ 7.6	-363	-19 34	160 12	2 24	} $C$
$d^1$	10.0	-362	-19 36	162 22	4 34	
$d^2$	11.6	-357	-19 21	163 48	6 0	
$d^3$	12.5	-331	-17 42	164 32	6 44	
$d^4$	15.3	-340	-18 25	167 5	9 17	
$d^5$	16.4	-390	-21 46	168 13	10 25	
$e^1$	24.8	+128	+ 9 45	176 11	18 23	
$e^2$	27.5	+172	+12 17	179 3	21 15	
$e^n$	26.9	+146				
$e_s$	28.4	+123	+ 9 59	178 52	21 4	$d$

July 3 0<sup>h</sup> 6<sup>m</sup>

$a$	-67.0	+120	+ 9 21	72 39	302 43	
$a^1$	66.7	+152	+11 19	72 41	302 45	
$a^2$	65.7	+113	+ 9 12	78 2	308 6	
$a^3$	65.0	+122	+ 9 49	79 41	309 45	

$b$	-45.8	-143''	- 5° 9'	110° 30'	340° 34'	
$c$	26.3	-366	-18 56	128 10	358 14	
$c^1$	20.1	-327	-16 26	134 24	4 28	
$c^2$	16.7	-355	-18 15	137 14	7 18	
$c^3$	14.2	-337	-17 8	139 38	9 42	
$c^4$	13.4	-335	-16 59	140 22	10 26	$a^2$
$d_1$	3.0	+117	+10 28	150 19	20 23	$b_1$
$d_2^s$	3.0	+124				
$d_2^n$	1.6	+143	+11 27	150 54	20 58	$b_1b_2$
$e$	+ 3.2	-307	-15 31	154 52	24 56	$a^6$
$f$	20.9	+ 64	+ 6 35	170 29	40 33	} $D$
$f^1$	24.8	+ 83	+ 7 34	174 2	44 6	

July 6 0<sup>h</sup> 39<sup>m</sup>

$a$	-54.3	-309	-16 50	93 59	6 29	$a$
$a^1$	53.7	-353	-19 42	93 30	6 0	$a^1$
$a^2$	51.4	-325	-17 39	97 55	10 25	$a^2$
$a^3$	47.0	-295	-15 26	104 31	17 1	
$a^4$	44.8	-307	-16 4	107 3	19 33	
$a^5$	43.3	-302	-15 40	108 53	21 23	$b$
$a^6$	39.4	-337	-17 46	112 45	25 15	$b^2$
$b_1$	44.9	+122	+10 12	108 12	20 42	$c_1$
$b_2^n$	44.9	+143				
$b_2^s$	43.9	+132	+11 9	108 22	20 52	$c_2$
$b^1$	42.7	+161	+12 39	110 15	22 45	
$c$	39.9	-162	- 6 45	114 2	26 32	$d$
$c^1$	34.8	-177	- 7 31	119 2	31 32	$d^2$
$d$	30.1	+ 49	+ 6 18	123 41	36 11	
$d^1$	24.9	+ 35	+ 5 34	128 26	40 56	
$d^2$	23.6	+ 47	+ 6 19	129 37	42 7	
$e$	+57.8	-217	-11 26	208 51	121 21	$e$
$e^1$	59.3	-245	-13 21	212 12	124 42	$e^2$
$f$	67.2	+126	+ 8 3	231 43	144 13	$ff^1$

July 7 0<sup>h</sup> 5<sup>m</sup>

$a$	-61.2	-286	-16 29	80 35	6 47	
$a^1$	60.3	-328	-19 9	80 41	6 53	
$a^2$	58.9	-309	-17 39	84 52	11 4	
$b^1$	54.9	-279	-15 16	92 59	19 11	$c^1?$
$b$	52.3	-289	-15 40	96 45	22 58	$c$
$b^2$	49.1	-325	-17 46	100 24	26 36	
$c_1$	55.0	+140	+10 24	94 13	20 25	$a_1$
$c_2^s$	54.7	+152				
$c_2^n$	53.9	+161	+11 28	94 57	21 9	$a_2$
$c^1$	52.1	+184	+13 18	97 27	23 39	
$d$	52.0	-135	- 5 58	99 19	25 31	$b$
$d^1$	50.3	-142	- 6 17	101 30	27 42	$b^1?$
$d^2$	46.6	-156	- 6 55	105 51	32 3	$b^3$
$e$	+47.8	-233	-11 19	193 59	120 11	$d$
$e^1$	49.2	-254	-12 43	195 58	122 10	

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date	Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1862 July 7—Continued							July 11 0 <sup>h</sup> 43 <sup>m</sup>						
$e^2$	+51°0	-259''	-13° 10'	198° 37'	124° 49'	$d^2$	$a$	-12°9	-228''	-10° 10'	134° 31'	117° 13'	$a$
$f$	63.1	+110	+ 8 22	217 2	143 14	$e$	$a^1$	12.4	-241	-10 57	134 59	117 41	$a^2?$
$f^1$	63.8	+110	+ 8 17	218 26	144 38	$e^1$	$a^2$	11.8	-230	-10 15	135 30	118 12	$a^1?$
$g$	64.6	-166	+ 8 25	221 14	147 26	$f$	$a^3$	9.1	-255	-11 42	137 48	120 30	
July 8 1 <sup>h</sup> 17 <sup>m</sup>							$a^4$	8.6	-274	-12 52	138 15	120 57	$a^4?$
$a_1$	-62.7	+158	+10 17	79 0	19 56		$a^5$	6.9	-271	-12 37	139 43	122 25	
$s$	62.5	+162	+10 51	80 14	21 10		$a^6$	6.1	-297	-14 12	140 28	123 10	$a^5$
$a_{2n}$	61.9	+171					$a^7$	+ 0.1	-315	-15 9	145 47	128 29	$b$
$b$	61.3	-116	- 6 3	83 58	24 54		$a^8$	0.7	-310	-14 49	146 20	129 2	
$b^1$	60.4	-114	- 5 48	85 43	26 39		$b$	17.0	+ 67	+ 8 37	159 21	142 3	$c$
$b^2$	58.7	-141	- 7 16	88 25	29 21		$b^1$	18.9	+ 32	+ 6 31	161 2	143 44	$c^1?$
$b^3$	57.8	-139	- 7 2	89 58	30 54		$b^2$	19.4	+ 64	+ 8 28	161 28	144 10	$c^2$
$c^1$	62.2	-275	-16 20	77 25	18 21		$c^1$	21.4	-219	- 8 41	163 56	146 38	$d^1$
$c$	60.6	-275	-16 3	81 27	22 23		$c^2$	22.5	-219	- 8 39	164 55	147 37	
$d$	+33.6	-236	-10 38	177 54	118 50	$a a^1$	$c$	23.5	-269	-11 46	166 34	149 16	$d$
$d^1$	35.4	-245	-11 15	179 46	120 42	$a^2$	$c^3$	24.5					
$d^2$	38.7	-280	-13 33	183 29	124 25	$a^5?$	$c^4$	25.4	-281	-12 30	168 3	150 45	$d^2$
$d^3$	42.3	-289	-14 13	187 44	128 40	$a^6$	$c^5$	28.1	-235	- 9 37	170 9	152 51	$d^3$
$e$	55.0	+ 91	+ 9 48	202 7	143 3	$b$	$c^6$	31.8	-278	-12 19	174 2	156 44	
$e^1$	56.2	+ 90	+ 9 39	203 52	144 48	$b^1$	$d^1$	31.8	-308	-14 13	174 22	157 4	
$f$	57.2	-189	- 8 46	205 41	146 37	$c$	$d$	59.0	-196	- 8 3	206 29	189 11	$f^1$
$f^1$	58.1	-197	- 9 20	207 19	148 15	$c^1$	$e$	60.6	-198	- 8 20	209 34	192 16	$f$
$f^2$	59.5	-250	-12 51	211 7	152 3	$c^2 c^3$		66.2	- 39	+ 0 44	220 45	203 27	$g$
$f^3$	60.8	-197	- 9 37	212 20	153 16	$c^5$	July 13 2 <sup>h</sup> 14 <sup>m</sup>						
July 10 0 <sup>h</sup> 30 <sup>m</sup>							$a$	-43.5	-183	- 9 42	103 42	115 21	
$a$	+ 2.7	-243	-10 9	148 42	117 15	$a^1$	$a^1$	42.7	-185	- 9 46	104 32	116 11	$a?$
$a^1$	3.3	-238	-10 20	149 12	117 45		$a^2$	42.7	-209	-11 14	104 25	116 4	
$a^2$	4.9	-248	-10 55	150 32	119 5		$a^3$	42.1	-197	-10 27	105 8	116 47	
$a^3$	5.3	-298	-14 8	150 45	119 18		$a^4$	40.3	-213	-11 16	107 0	118 39	
$a^4$	6.4	-265	-11 57	151 55	120 28	$a^3$	$a^5$	36.8	-257	-13 43	110 27	122 6	
$a^5$	10.2	-306	-14 29	155 22	123 55	$a^6$	$b$	30.8	-287	-15 5	116 21	128 0	
$a_{6n}$	15.8	-314	-15 2	160 19	128 52	$a^7$	$b^1$	27.9	-243	-12 3	119 19	130 58	$B$
$s$		-318					$b^2$	24.0	-246	-11 59	122 55	134 34	
$b$	31.7	+ 60	+ 8 0	173 40	142 13	$b$	$b^3$	22.6	-248	-12 0	124 14	135 53	
$b^1$	34.0	+ 62	+ 8 7	175 53	144 26	$b^2$	$c$	15.9	+ 81	+ 8 24	129 12	140 51	
$b^2$	35.2	+ 69	+ 8 31	177 4	145 37		$c^1$	13.2	+ 63	+ 7 28	131 37	143 16	$c$
$c$	35.6	-224	- 9 17	178 10	146 43		$c^2$	12.7	+ 81	+ 8 35	131 58	143 37	
$c^1$	36.5	-227	- 9 29	179 7	147 40		$c^3$	11.6	+ 58	+ 7 16	133 1	144 40	
$c^2$	38.3	-277	-12 39	181 30	150 3	$c$	$d^1$	10.9	-204	- 8 32	134 27	146 6	$d^1$
$c^3$	39.1	-281	-12 55	182 25	150 58		$d^s$	8.9	-259	-11 32	136 43	148 22	$d$
$c^4$	40.2	-300	-14 9	183 52	152 25		$d_n$	7.9	-250				
$c^5$	41.6	-240	-10 23	184 36	153 9		$d^2$	6.6	-278	-12 54	138 20	149 59	$d^2?$
$c^6$	44.1	-284	-13 14	187 58	156 31	$c^4$	$d^3$	4.4	-229	- 9 44	140 3	151 42	
$c^7$	44.1	-309	-14 50	188 24	156 57	$c^5$	$d^4$	2.8	-324	-15 38	141 41	153 20	
$d$	65.7	-185	- 8 46	223 56	192 29	$c^6$	$d^5$	0.3	-291	-13 25	143 44	155 23	
						$d$	$e$	+14.3	-422	-21 20	157 26	169 5	
							$e^1$	19.5	-424	-21 20	162 20	173 59	

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1862 July 13—Continued						
$f^1$	+36.7	-209''	- 7° 21'	176° 34'	188° 13'	
$f$	39.5	-224	- 8 18	179 33	191 12	
$g$	50.6	- 75	+ 0 43	191 6	202 45	
July 15 0 <sup>h</sup> 51 <sup>m</sup>						
$a$	-62.1	-124	- 9 13	75 19	114 14	
$b^{\text{n}}$	53.9	-172	-10 56	89 16	128 11	
$b^{\text{s}}$	53.2	-191				
$b^1$	48.5	-181	-10 37	96 5	135 0	
$b^2$	48.2	-200	-11 46	96 20	135 15	
$c$	42.8	+129	+ 8 46	101 12	140 7	
$d^1$	38.8	-159	- 8 26	107 7	146 2	
$d$	37.1	-207	-10 54	108 43	147 38	$a$
$d^2$	35.5	-214	-11 10	110 19	149 14	
$e$	23.7	-338	-17 56	121 25	160 20	
$e^1$	21.0	-294	-14 52	124 1	162 56	
$e^2$	19.0	-333	-16 55	125 25	164 20	
July 18 0 <sup>h</sup> 59 <sup>m</sup>						
$a$	-64.3	-131	-11 30	66 32	147 38	
$b$	64.3	+138	+ 4 40	64 34	145 40	
$c^{\text{n}}$	56.8	- 64	- 6 17	82 12	163 18	$a$
$c^{\text{s}}$		- 87				
$c^1$	53.9	- 51	- 4 17	86 25	167 31	$a^2$
$c^2$	52.5	- 67	- 4 55	88 21	169 27	
$c^3$	51.7	- 39	- 3 10	89 29	170 35	$a^3$
$d^1$	44.6	+308	+18 35	92 18	173 24	$b^1?$
$d$	42.5	+310	+19 0	94 42	175 48	$b^2$
$e$	39.4	+228	+14 30	100 6	181 12	$c$
$e^1$	37.9	+251	+16 5	101 16	182 22	$c^1?$
$e^2$	36.3	+225	+14 45	103 30	184 36	$c^2$
$e^3$	34.8	+228	+15 5	104 56	186 2	
$f$	34.0	-147	- 7 18	109 13	190 19	$d^1$
$g$	26.6	-179	- 8 25	116 14	197 20	$d$
$g^1$	23.5	-186	- 8 30	119 5	200 11	
$g^2$	22.8	-214	-10 9	119 47	200 53	$d^2$
$g^3$	20.9	-188	- 8 22	121 26	202 32	$d^3$
$g^4$	19.6	-209	- 9 31	122 39	203 45	$d^4?$
$g^5$	19.6	-237	-11 15	122 43	203 49	$d^5$
$g^6$	18.6	-225	-10 25	123 35	204 41	$d^6$
$h$	20.9	- 28	+ 1 19	120 41	201 47	$e$
$i$	+60.2	+ 32	+ 8 49	201 14	282 20	$f$
$i^1$	62.2	+ 46	+ 9 31	205 20	286 26	$f^4$
$i^2^{\text{n}}$		+ 99	+12 16	209 29	290 35	$f^6$
$i^{\text{s}}$	63.7	+ 90				
$i^3$	66.4	+ 53	+ 9 18	217 39	298 45	$f^7$
July 19 2 <sup>h</sup> 51 <sup>m</sup>						
$a^{\text{n}}$	-64.1	- 37''	- 6° 22'	66° 50'	163° 4'	
$a^{\text{s}}$		- 48				
$a^1$	63.4	- 57	- 7 2	68 38	164 52	
$a^2$	62.3	- 18	- 4 23	71 6	167 20	
$a^3$	60.8	- 2	- 3 3	74 3	170 17	
$b$	55.1	+337	+18 0	74 11	170 25	
$b^1$	54.4	+337	+18 12	75 59	172 13	
$b^2$	52.3	+351	+19 29	78 47	175 1	
$b^3$	51.9	+340	+18 55	79 55	176 9	
$c^{\text{s}}$		+245				
$c^{\text{n}}$	50.7	+256	+13 50	84 56	181 10	
$c^1$	48.3	+269	+15 20	87 33	183 47	
$c^2$	46.8	+251	+14 31	89 55	186 9	
$d^1$	47.4	-117	- 7 31	93 49	190 3	
$d$	41.6	-143	- 8 14	100 23	196 37	
$d^2$	39.0	-175	- 9 50	103 10	199 24	
$d^3$	38.2	-161	- 8 52	104 0	200 14	
$d^4$	37.4	-173	- 9 29	104 50	201 4	
$d^5$	34.8	-214	-11 41	107 32	203 46	
$d^6$	34.0	-191	-10 9	108 19	204 33	
$e^{\text{n}}$		+ 7				
$e^{\text{s}}$	36.2	- 2	+ 1 16	105 16	201 30	
$f^1$	+45.9	+ 9	+ 8 3	180 0	276 14	A
$f$	50.0	+ 25	+ 9 4	184 56	281 10	
$f^2$	50.2	+ 57	+11 0	185 19	281 33	
$f^3$	52.7	+ 28	+ 9 15	188 27	284 41	
$f^4$	53.5	+ 38	+ 9 51	189 41	285 55	
$f^5$	54.5	+ 81	+12 26	191 15	287 29	
$f^6$	56.3	+ 84	+12 35	194 6	290 20	
$f^7$	61.1	+ 35	+ 9 26	201 59	298 13	
July 25 23 <sup>h</sup> 31 <sup>m</sup>						
$a^1$	-33.8	+124	+ 7 53	100 25	278 54	
$a$	32.8	+ 97	+ 6 28	101 46	280 15	$a$
$a^2$	30.3	+151	+10 4	103 23	281 52	
$a^3$	28.6	+167	+11 17	104 44	283 13	$a^1$
$a^4$	28.0	+154	+10 37	105 33	284 2	
$a^5$	27.9	+ 99	+ 7 24	106 26	284 55	
$a^6$	23.3	+158	+11 35	109 47	288 16	
$a^7$	22.5	+152	+11 21	110 37	289 6	$a^2$
$a^8$	17.2	+131	+10 55	115 37	294 6	
$a^9$	10.6	+197	+15 48	120 39	299 8	
$a^{10}$	9.1	+197	+16 0	121 56	300 25	
$b$	+31.6	+106	+15 1	159 18	337 47	
$b^1$	32.3	+117	+15 45	159 59	338 28	
$b^2$	23.5	+ 92	+14 20	161 14	339 43	
$c^{\text{n}}$	47.0	+104	+15 34	176 38	355 7	b <sub>1</sub> b <sub>2</sub>
$c^{\text{s}}$	47.7	+ 92				
$c^{\text{n}}$	47.0	+ 83				
$c^{\text{s}}$	48.6	+ 67	+14 12	177 5	355 34	



Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1862 July 25—Continued						
$c^1$	+52 <sup>s</sup> 8	+122''	+17° 12'	184° 6'	2° 35'	$b^3$
$c^2$	53.3	+ 94	+15 31	184 32	3 1	
$c^3$	53.3	+ 41	+12 18	184 15	2 44	
$c^4$	53.9	+147	+18 45	186 3	4 32	$b^4$
$c^5$	54.5	+ 83	+14 52	186 23	4 52	$b^6$
$c^6$	55.3	+ 67	+13 54	187 25	5 54	
$c^7$	55.3	+ 32	+11 48	187 16	5 45	$b^7$
July 27 0 <sup>h</sup> 27 <sup>m</sup>						
$a$	-54.4	+183	+ 6 37	73 5	280 11	
$a^1$	51.1	+243	+10 54	76 4	283 10	$a$
$a^2$	47.2	+236	+11 25	81 28	288 34	
$a^3$	45.7	+258	+13 2	82 41	289 47	
$y$	34.2	-201	-11 55	101 6	309 53	$b^1$
$y^1$	32.6	-187	-10 45	102 33	311 20	$b^2$
$x$	15.8	-556	-27 26	151 8	358 14	
$x^1$	16.1	-565	-28 2	151 43	358 49	
$b^1$	+17.2	+121	+14 57	143 36	350 42	
$b_1^{\text{n}}$	19.1	+141				
$b_1^{\text{s}}$	21.4	+107	+15 29	146 24	353 30	$c_1c_2$
$b_2$	22.5	+125	+15 47	148 27	355 33	$c_3c_4$
$b^2$	26.9	+102	+14 53	152 46	359 52	$c^2$
$b^3$	28.5	+148	+17 50	154 7	1 13	$c^3$
$b^4$	29.9	+167	+19 7	155 29	2 35	$c^4$
$b^5$	30.6	+ 37	+11 20	156 33	3 39	$c^5$
$b^6$	32.0	+ 99	+15 11	157 45	4 51	$c^7$
$b^7$	32.0	+ 51	+12 18	157 54	5 0	
$c^1$	25.1	-321	-10 50	155 10	2 16	
$c$	26.9	-335	-11 32	157 7	4 13	
$d$	52.3	-360	-11 33	187 30	34 36	$d$
$d^1$	53.8	-358	-11 26	189 57	37 3	$d^2?$
$d^2$	55.3	-394	-13 51	194 36	41 42	$d^6$
$d^3$	56.5	-369	-12 14	195 41	42 47	$d^8$
$d^4$	58.4	-362	-11 55	199 44	46 50	$d^{11}$
$e$	62.5	-325	-10 14	211 46	58 52	$e_1e_2$
July 29 2 <sup>h</sup> 20 <sup>m</sup>						
$a^{\text{n}}$	-61.6	+329	+11 20	47 50	284 6	
$a^{\text{s}}$		+323				
$b^1$	57.1	-105	-11 46	70 52	307 8	
$b^2$	56.0	-102	-11 15	72 43	308 59	
$b$	53.7	-137	-12 46	76 10	312 26	
$c_1^{\text{n}}$	12.4	+197				
$c_1^{\text{s}}$	10.5	+162	+14 36	115 47	352 3	$b_1$
$c_2$	10.5	+180	+14 50	116 56	353 12	
$c_3$	8.8	+185	+15 22	118 2	354 18	$b_2$
$c_4$	8.0	+187	+15 36	118 43	354 59	
Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$c^1$	- 7 <sup>s</sup> 0	+215''	+17° 26'	119° 10'	355° 26'	
$c^2$	4.4	+162	+14 41	122 11	358 27	$b^1$
$c^3$	2.1	+197	+17 10	123 45	0 1	
$c^4$	0.8	+211	+18 15	124 43	0 59	$b^3$
$c^5$	+ 0.2	+ 93	+11 17	126 56	3 12	$b^2$
$c^6$	0.6	+121	+13 1	126 59	3 15	$b^4$
$c^7$	2.2	+151	+15 3	128 2	4 18	$b^5$
$d^1$	28.4	-374	-13 17	157 38	33 54	$c^1$
$d$	29.7	-326	-10 7	157 53	34 9	
$d^2$	29.7	-374	-13 9	158 55	35 11	
$d^3$	30.5	-342	-11 3	159 3	35 19	$c^2$
$d^4$	32.7	-378	-13 5	162 2	38 18	
$d^5$	33.9	-346	-10 57	162 34	38 50	
$d^6$	36.2	-394	-13 48	166 9	42 25	$c^4$
$d^7$	36.8	-389	-13 26	166 40	42 56	
$d^8$	37.3	-369	-12 7	166 41	42 57	$c^6$
$d^9$	38.4	-364	-11 43	167 48	44 4	
$d^{10}$	39.0	-380	-12 41	168 54	45 10	$c^8$
$d^{11}$	40.6	-371	-12 40	170 13	46 29	$c^9$
$e_1$	51.3	-356	-10 29	184 8	60 24	$d$
$e_2$	51.7	-344	- 9 43	184 19	60 35	
$e^1$	55.3	-335	- 9 7	190 2	66 18	
$e^2$	61.8	-316	- 8 29	205 43	81 55	$e$
July 31 3 <sup>h</sup> 48 <sup>m</sup>						
$a$	-40.9	-276	-18 44	90 37	355 48	
$a^1$	40.3	-286	-19 16	91 15	356 26	
$a^2$	38.3	-281	-18 27	93 29	358 40	
$a^3$	36.3	-274	-17 31	95 39	0 50	
$a^4$	35.5	-283	-17 55	96 31	1 42	
$b_1^{\text{s}}$	38.5	+256				
$b_1^{\text{n}}$	36.5	+281	+14 31	87 18	352 29	$a_1$
$b_2$	35.6	+280	+15 37	88 56	354 7	$a_2$
$b^1$	33.0	+260	+15 2	92 10	357 21	
$b^2$	29.3	+193	+11 53	97 13	2 24	
$b^3$	29.0	+304	+18 29	94 59	0 10	$a^4$
$b^4$	28.6	+211	+13 5	97 31	2 42	$a^2$
$b_5^{\text{n}}$	26.9	+246				
$b_5^{\text{s}}$	25.4	+224	+15 0	99 21	4 32	$a^5$
$b^6$	24.2	+233	+15 17	101 13	6 24	
$c$	2.7	-265	-10 23	126 31	31 42	$b$
$c^1$	+ 0.0	-310	-12 43	129 22	34 33	$b^1$
$c^2$	2.1	-288	-11 0	130 54	36 5	$b^2$
$c^3$	6.9	-309	-11 35	135 16	40 27	$c^1$
$c^4$	9.0	-345	-13 30	137 39	42 50	$c$
$c^5$	10.1	-311	-11 12	138 6	43 17	$c^2$
$c^6$	10.2	-325	-12 4	138 24	43 35	
$c^7$	11.6	-297	-10 5	139 13	44 24	
$c^8$	12.6	-338	-12 32	140 43	45 54	$c^3$
$c^9$	13.0	-334	-12 12	141 0	46 11	$c^4$

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date	Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1862 July 31—Continued													
$d_s$	+28.2	-332"	- 9° 18'	155° 20'	60° 31'	$d_1, d_2$	$c^1$	-43.2	-184"	-14° 19'	84° 25'	43° 57'	
$n$	29.5	-309					$c^2$	41.0	-168	-12 43	86 44	46 16	$b^1$
$d^1$	31.1	-327	- 9 27	157 38	62 49		$d_1$	27.3	-168	- 9 19	100 34	60 6	$c_1$
$e$	47.7	-336	- 8 34	176 39	81 50	$e$	$d_2$	25.9	-177	- 9 34	101 53	61 25	$c_2$
$f$	58.2	-382	-11 34	197 48	102 59	$f$	$e^1$	12.9	+396	+27 12	103 50	63 22	
August 2 3 <sup>h</sup> 37 <sup>m</sup>							$e$	9.3	+391	+27 43	107 26	66 58	
$a_1$	-55.1	+336	+13 54	60 23	353 32	} $a$	$f$	+ 1.7	-272	- 9 43	127 0	86 32	$d$
$s$	53.2	+358					$f^1$	4.5	-267	- 8 54	129 20	88 52	$d^1, d^2$
$a_2$	52.2	+370	+15 50	62 28	355 37		$f^2$	5.6	-300	-10 44	130 48	90 20	
$a^1$	50.9	+381	+16 52	63 54	358 3		$g^1$	17.4	-361	-12 31	142 12	101 44	$e^1$
$a^2$	49.7	+299	+12 37	69 33	2 42		$g$	18.5	-334	-10 39	142 40	102 12	
$a^3$	48.9	+286	+12 7	71 9	4 18	$a^1$	$g^2$	19.5	-389	-13 57	144 38	104 10	
$a^4$	48.1	+388	+18 8	67 47	0 56		$g^3$	20.6	-359	-11 54	145 5	104 37	$e$
$a^5$	47.5	+329	+14 57	71 18	4 27	$a^2$	$h$	37.7	-380	-10 54	162 37	122 9	$g^1$
$b$	32.4	-183	-11 13	97 26	30 35	$b$	$h^1$	39.3	-403	-12 11	165 2	124 34	$g^2$
$b^1$	29.1	-220	-12 44	100 54	34 3	$b^1$	$h^2$	42.6	-389	-11 11	168 42	128 14	$g^3$
$b^2$	26.5	-213	-11 44	103 19	36 28	$b^2$	$i_1$	52.7	- 53	+10 7	175 5	134 37	$i$
$b^3$	26.2	-188	-10 9	103 22	36 31	$b^3$	$i_2$	53.0	- 40	+11 9	175 24	134 56	$i^1$
$c^1$	20.8	-259	-13 22	108 57	42 6		$i_3$	53.9	- 26	+12 3	176 40	136 12	$i^2$
$c$	19.6	-282	-14 32	110 17	43 26	$c^1$	$i^1$	56.6	- 30	+11 56	180 54	140 26	
$c^2$	18.4	-245	-11 59	111 2	44 11	$c$	$i^2$	57.6	- 19	+12 37	182 40	142 12	$i^4$
$c^3$	16.7	-275	-13 31	112 47	45 56		$i^3$	59.0	- 14	+12 57	185 17	144 49	
$c^4$	16.3	-273	-13 20	113 6	46 15	$c^2$	$k$	60.4	-313	- 5 39	196 29	156 1	$k$
$d_1$	+ 0.1	-273	-10 14	127 18	60 27	$d_1$	August 6 23 <sup>h</sup> 55 <sup>m</sup>						
$d_2$	1.6	-273	- 9 59	128 33	61 42	$d_2$	$a$	-64.8	+ 9	-10 54	43 35	30 42	
$e^1$	23.3	-325	- 9 48	148 29	81 38		$a^1$	64.1	- 19	-12 7	46 41	33 48	
$e$	29.3	-343	-10 8	154 33	87 42	} $f$	$b$	60.7	- 33	-11 19	55 48	42 55	
$e^2$	29.9	-336	- 9 37	155 0	88 9		$b^1$	60.1	- 59	-12 39	57 13	44 20	
$f$	41.3	-405	-12 46	169 7	102 16	} $G$	$c_1$	50.6	- 61	- 9 24	72 39	59 46	} $a$
$f^1$	43.4	-403	-12 26	171 36	104 45		$c_2$	49.9	- 64	- 9 20	73 37	60 44	
$g^1$	54.0	-406	-12 10	187 56	121 5		$c^1$	49.8	- 96	-11 16	73 57	61 4	
$g^2$	55.1	-403	-12 0	190 9	123 18		$c^2$	47.8	- 64	- 8 44	76 12	63 19	
$g$	57.3	-399	-11 53	195 17	128 26	$h^2$	$d$	27.2	-164	- 9 14	98 50	85 57	
$h_1$	65.1	- 39	+10 14	202 43	135 52	$i_2$	$d^1$	23.4	-181	- 9 22	102 28	89 35	
$h_2$	65.1	- 46	+ 9 48	202 44	135 53	$i_1$	$d^2$	23.0	-176	- 8 57	102 49	89 56	
August 4 0 <sup>h</sup> 43 <sup>m</sup>							$e^1$	12.2	-267	-12 4	113 23	100 30	
$a$	-59.2	+414	+14 17	38 7	357 39		$e^2$	11.4	-274	-12 19	114 10	101 17	$b^2$
$a^1$	58.8	+371	+12 34	45 56	5 28		$e$	7.8	-280	-11 55	117 22	104 29	$b^3?$
$a^2$	57.2	+414	+15 30	46 12	5 44		$f$	+ 5.4	-253	- 7 39	128 14	115 21	
$b$	53.5	- 84	-11 10	70 40	30 12	$a$	$g$	11.0	-319	-10 38	134 4	121 11	
$b^1$	51.3	-114	-12 18	73 56	33 28	$a^1$	$g^1$	13.9	-338	-11 17	137 0	124 7	} $C$
$b^2$	49.7	-119	-12 7	76 4	35 36		$g^2$	14.7	-356	-12 16	138 0	125 7	
$b^3$	49.2	- 86	- 9 59	76 31	36 3		$g^3$	18.4	-342	-10 46	141 6	128 13	
$b^4$	48.3	-114	-11 6	77 50	37 22		$i$	28.9	- 16	+ 9 59	146 35	133 42	$d$
$c$	43.2	-137	-11 23	84 8	43 40	$b$	$i^1$	30.1	- 33				
							$i^2$	30.9	+ 7	+12 4	147 40	134 47	$d^1$
							$i^3$	32.9	+ 2	+12 3	149 41	136 48	
								34.9	+ 30	+13 9	151 23	138 30	$d^2$

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date	Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1862 August 6—Continued							August 12 0 <sup>h</sup> 18 <sup>m</sup>						
$i^4$	+37.7	+ 5"	+12° 54'	154° 38'	141° 45'	$d^4$	$a^1$	-61.50	+ 7"	-11° 8'	48° 22'	119° 55'	
$i^5$	38.1	+ 30	+14 27	154 53	142 0	$d^5$	$a^2$	60.6	- 12	-12 4	49 31	121 5	
$k$	45.9	-311	- 5 7	168 49	155 56	$e$	$a_1$	59.0	- 37	-12 49	53 8	124 41	
August 8 0 <sup>h</sup> 49 <sup>m</sup>							$a_2$	59.0	- 53	-13 46	53 16	124 49	
$a$	-63.6	+ 23	-10 8	45 26	61 9		$b^{\text{n}}$	48.7	+290	+ 9 26	61 22	132 55	$a^1$
$b$	41.5	-161	-13 8	82 33	98 16		$b^{\text{s}}$	48.0	+281				$a^3?$
$b^1$	39.2	-186	-14 0	85 15	100 58		$b^1$	45.8	+320	+12 15	63 22	134 55	$a^2$
$b^2$	37.7	-172	-12 41	86 48	102 31		$b^2$	44.8	+268	+ 9 43	66 38	138 11	
$b^3$	36.0	-179	-12 41	88 34	104 17		$b^3$	43.1	+316	+12 56	66 52	138 25	
$c$	20.5	-216	-10 54	103 42	119 25		$b^4$	41.5	+263	+10 31	70 39	142 12	$a^4$
$c^1$	18.8	-244	-12 11	105 37	121 20	$a$	$b^5$	40.7	+311	+13 27	69 50	141 24	$a$
$c^2$	15.9	-238	-11 8	108 6	123 49	$a^2$	$b^6$	39.1	+323	+14 38	71 13	142 46	
$c^3$	15.4	-276	-13 20	108 59	124 42	$a^3$	$c$	36.3	- 49	- 5 36	83 5	154 38	
$c^4$	14.2	-267	-12 30	109 55	125 38		$d$	15.1	-281	-12 39	105 39	177 12	
$d^{\text{n}}$	+ 0.1	+ 53	+ 9 9	118 7	133 50	$b$	$e^1$	0.5	- 54	+ 3 23	114 48	186 21	
$d^{\text{s}}$	1.2	+ 37					$e$	+ 2.4	- 72	+ 2 59	117 32	189 5	
$d^1$	2.1	+ 79	+11 27	118 51	134 34	$b^1$	$e^2$	4.3	- 72	+ 3 25	119 7	190 40	
$d^2$	7.8	+ 98	+13 43	123 31	139 14		$f$	8.2	-326	-13 42	126 51	198 24	
$d^3$	8.7	+ 68	+12 1	124 11	139 54		$g$	28.3	-538	-20 16	151 12	222 45	
$d^4$	10.2	+ 75	+12 50	125 54	141 37	$b^4$	$g^1$	31.3	-546	-20 16	154 53	226 26	
$d^5$	10.8	+ 91	+13 54	126 14	141 57	$b^5$	$g^2$	33.5	-558	-20 44	157 59	229 32	
$d^6$	10.8	+ 47	+19 13	127 8	142 51		$i$	64.4	-124	+ 8 35	196 38	268 11	$d$
$e$	20.4	-274	- 5 52	139 54	155 37	$c$	August 14 0 <sup>h</sup> 7 <sup>m</sup>						
$f$	40.3	+ 86	+18 40	155 7	170 50		$a^1$	-58.3	+391	+ 9 54	33 9	132 37	
$f^1$	42.1	+ 95	+19 27	157 13	172 56		$a^2$	57.5	+382	+10 0	36 56	136 24	
August 10 0 <sup>h</sup> 19 <sup>m</sup>							$a^3$	56.3	+416	+12 18	37 2	136 30	
$a$	-44.4	-115	-11 37	77 5	120 35	$a^1? a^2$	$a^4$	55.2	+375	+10 53	43 32	143 0	$a$
$a^1$	43.3	- 92	- 9 59	78 2	121 32		$a$	53.7	+428	+14 15	42 30	141 58	
$a^2$	41.5	-117	-10 52	80 20	123 50		$b$	+40.7	-475	-13 34	161 21	260 49	$c$
$a^3$	41.5	-156	-13 12	80 42	124 12	$a_1? a_2$	$c$	50.9	- 28	+14 57	163 34	263 2	$D$
$a^4$	36.3	-152	-11 24	86 15	129 45		$d^{\text{n}}$		-121	+ 9 25	168 36	268 4	$e$
$b^{\text{n}}$	27.4	+168					$d^{\text{s}}$	53.5	-130				
$b^{\text{s}}$	26.3	+156	+ 9 23	90 5	133 35	$b$	$e$	63.9	- 70	+12 49	191 8	290 36	$g$
$dot(b)$	26.8	+126	+ 7 20	90 54	134 24		August 15 0 <sup>h</sup> 49 <sup>m</sup>						
$b^1$	24.7	+199	+12 4	91 15	134 45	$b^1$	$a$	-57.5	+417	+11 12	31 32	145 29	
$b^2$	20.6	+189	+12 34	95 12	138 42	$b^3$	$b$	+ 4.9	-310	-10 13	120 59	234 56	
$b^3$	19.5	+152	+10 44	96 59	140 29	$b^1$	$c$	29.5	-449	-13 30	146 43	260 40	
$b^4$	18.0	+185	+13 0	97 39	141 9	$b^5$	$c^1$	31.3	-451	-13 16	148 48	262 45	} A
$b^5$	17.2	+206	+14 24	97 52	141 22		$d$	39.4	- 5	+14 53	148 7	262 4	
$b^6$	15.8	+185	+13 32	99 33	143 3		$d^1$	40.6	- 14	+14 34	149 33	263 30	
$c$	8.7	-173	- 5 33	111 36	155 6	$c$	$d^2$	41.5	- 18	+14 27	150 34	264 31	
$d$	+14.8	+ 99	+15 22	127 39	171 9		$e^{\text{n}}$		- 93	+ 9 53	153 50	267 47	$b, b_2$
$e$	30.5	-162	+ 2 55	145 35	189 5	$e$	$e^{\text{s}}$	43.4	-109				
$e^1$	33.3	-141	+ 4 37	148 5	191 35		$f$	49.6	-546	-17 17	179 49	293 46	
$f$	47.3	-566	-20 32	180 31	224 1	} $gg^1$	$g$	58.1	- 84	+12 33	175 9	289 6	$c$
$f^1$	47.6	-562	-20 13	180 45	224 15		$h$	62.6	-112	+10 47	186 44	300 41	



Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1862 August 17 0 <sup>h</sup> 15 <sup>m</sup>						
$a_1$	+ 1.3	-322"	-11° 38'	116° 26'	258° 8'	} $a$
$a_2$	1.3	-338	-12 37	116 46	258 28	
$a^1$	2.8	-354	-13 12	118 22	260 4	
$a^2$	4.5	-333	-11 29	119 24	261 6	$a^2$
$a^3$	6.0	-352	-11 50	120 45	262 27	} $a^3$
$a^4$	6.9	-358	-12 26	121 56	263 38	
$b_1$	18.1	- 18	+10 10	125 23	267 5	
$b_2$	18.6	- 32	+ 9 29	126 6	267 48	$b_2$
$b^1$	21.4	- 25	+10 31	128 32	270 14	$b^2$
$b^2$	23.1	+ 63	+16 0	128 47	270 29	} $c$
$c$	39.3	- 56	+12 21	146 45	288 27	
$c^1$	40.7	- 61	+12 18	148 23	290 5	
$c^2$	41.9	- 54	+12 55	149 40	291 22	} $c^2$
$c^3$	43.4	- 84	+11 24	151 45	293 27	
August 18 3 <sup>h</sup> 14 <sup>m</sup>						
$a_n$	-16.1	-247	-12 8	100 8	257 36	} $a$
$a_s$	14.4	-265	-12 8	100 8	257 36	
$a^1$	12.9	-240	-10 31	101 51	259 19	
$a^2$	10.4	-260	-10 59	104 23	261 51	$a^2$
$a^3$	9.6	-308	-13 39	105 56	263 24	$a^5$
$a^4$	7.5	-304	-12 50	107 37	265 5	$a^7$
$b_1$	+ 2.6	+ 35	+ 9 34	110 1	267 29	$a^8$
$b_2$	2.9	+ 28	+ 9 14	110 21	267 49	} $b$
$b^1$	5.0	+ 19	+ 9 16	112 20	269 48	
$b^2$	5.8	+ 32	+10 12	112 47	270 15	
$b^3$	8.6	+ 71	+13 10	114 31	271 59	$b^1$
$c$	25.5	- 14	+12 15	131 1	288 29	} $c$
$c^1$	26.5	- 9	+12 45	131 57	289 25	
$c^2$	27.3	- 31	+11 39	133 2	290 30	
$c^3$	28.2	- 44	+11 5	134 2	291 30	} $c^4$
$c^4$	32.9	- 28	+13 1	138 31	295 59	
$c^5$	36.1	+ 21	+16 32	141 15	298 43	
$d^1$	37.9	-451	-11 16	153 29	310 57	} $d^5$
$d$	39.6	-450	-10 54	155 29	312 57	
$e_n$		- 62				
$e_s$	64.4	- 86	+13 42	191 37	349 5	$f$
August 20 22 <sup>h</sup> 19 <sup>m</sup>						
$a$	-39.7	-119	-12 2	73 17	255 57	} $a$
$a^1$	37.7	-118	-11 20	75 8	257 48	
$a^2$	36.9	-111	-10 35	76 2	258 42	
$a^3$	36.9	-139	-12 15	76 27	259 7	$a^3$
$a^4$	35.3	-177	-13 57	78 37	261 18	$a^4$
$a^5$	34.0	-137	-11 6	79 25	262 5	} $a^5$
$a^6$	33.1	-142	-10 57	80 21	263 1	
$a^7$	32.8	-177	-13 4	81 9	263 49	
$a^8$	30.9	-174	-12 15	83 0	265 40	$a^6$

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	$\Delta'$	Letter on next date
$b$	-21.6	+161"	+ 9° 47'	84° 54'	267° 34'	$b$
$b^1$	19.5	+144	+ 9 28	87 9	269 50	} $c$
$c^1$	+ 1.0	+137	+15 3	104 57	287 37	
$c$	1.3	+ 86	+12 11	106 10	288 50	
$c^2$	2.4	+ 81	+12 12	107 11	289 51	$c^1$
$c^3$	5.4	+ 65	+12 6	110 3	292 43	} $c^2?$
$c^4$	8.6	+ 75	+13 29	112 38	295 18	
$c^5$	9.3	+ 61	+12 54	113 32	296 12	
$d$	13.0	-381	-11 55	125 19	307 59	$d$
$d^1$	13.0	-402	-13 12	125 50	308 30	} $d^1$
$d^2$	14.0	-393	-12 24	126 30	309 10	
$d^3$	16.5	-411	-12 53	129 12	311 52	
$d^4$	17.4	-368	-10 2	128 55	311 35	} $d^4$
$d^5$	18.8	-382	-10 34	130 32	313 12	
$e^1$	40.9	+105	+22 53	144 14	326 54	
$e^2$	42.9	+ 95	+22 40	146 45	329 25	$f^1$
$e$	43.7	+104	+23 22	147 47	330 27	$f^2$
$f_s$	55.6	- 93				$f^3$
$f_n$	56.5	- 72	+14 4	167 8	349 49	$g$
$g$	59.6	-137	+10 59	175 18	357 58	$g^2$
August 22 0 <sup>h</sup> 7 <sup>m</sup>						
$a$	-58.2	+ 7	-12 49	44 8	255 55	} $a$
$a^1$	56.6	+ 14	-11 37	47 0	258 47	
$a^2$	56.3	- 9	-12 48	47 50	259 37	
$a^3$	55.3	- 7	-12 14	49 30	261 17	} $b$
$a^4$	54.7	- 28	-13 9	50 52	262 39	
$a^5$	54.2	+ 2	-11 12	51 5	262 52	
$a^6$	52.4	- 32	-12 23	54 23	266 10	} $c?$
$b$	44.0	+304	+ 9 34	56 18	268 5	
$c$	25.6	+223	+11 44	77 34	289 21	
$c^1$	24.2	+227	+12 26	78 48	290 35	} $c?$
$c^2$	21.1	+218	+12 56	81 50	293 37	
$d$	16.7	-248	-12 11	95 17	307 4	
$d^1$	16.0	-250	-12 3	95 59	307 46	} $c?$
$d^2$	12.8	-253	-11 15	98 45	310 32	
$d^3$	11.0	-273	-11 54	100 40	312 27	
$d^4$	10.0	-237	- 9 27	100 53	312 40	} $c?$
$e$	+ 3.9	-368	-13 18	115 20	327 7	
$f$	15.5	+185	+21 54	114 48	326 35	
$f^1$	16.4	+197	+22 52	115 27	327 14	} $d$
$f^2$	19.5	+179	+22 38	118 40	330 27	
$f^3$	20.1	+186	+23 11	119 8	330 55	
$g_n$	34.8	- 22				} $e$
$g_s$	36.4	+ 44	+14 3	137 41	349 28	
$g^1$	37.8	- 51	+13 11	140 22	352 9	
$g^2$	41.6	-106	+11 9	145 25	357 12	$e^1?$
August 24 0 <sup>h</sup> 5 <sup>m</sup>						
$a$	-54.9	+426	+10 14	28 58	268 48	} $e$
$b$	44.6	+369	+12 17	50 16	290 6	

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1862 August 24—Continued						
$b^1$	-41 <sup>s</sup> .6	+383''	+14° 16'	53° 19'	293° 9'	b
c	38.4	-95	-10 49	70 27	310 17	
d	9.0	+327	+22 54	87 30	327 20	
$d^1$	6.4	+332	+24 2	89 39	329 29	
$d^2$	5.2	+314	+23 22	91 14	331 4	
$d^3$	4.6	+350	+25 41	90 46	330 36	
$e^{\text{ns}}$	+8.9	+93	+14 21	109 35	349 25	c
$e^{\text{s}}$	10.8	+65				
$e^1$	13.0	+59	+14 4	112 42	352 32	$c^2$
$e^2$	14.5	+75	+15 25	113 47	353 37	$c^4$
f	52.4	-469	-8 57	171 55	51 45	f
August 26 0 <sup>h</sup> 29 <sup>m</sup>						
a	-58.6	+62	-11 1	38 7	306 15	a
b	31.0	+474	+23 2	58 40	326 48	
$c^1$	19.9	+290	+16 56	76 40	344 48	
$c^{\text{s}}$	17.7	+210	+14 11	81 26	349 34	
$c^{\text{n}}$	15.9	+233				
$c^2$	13.4	+199	+14 4	85 0	353 8	
$c^3$	12.9	+270	+18 12	83 30	351 38	b?
$c^4$	12.0	+219	+15 38	85 40	353 48	
$c^5$	11.5	+199	+14 41	86 36	354 44	
d	3.2	+238	+19 34	92 49	0 57	
$d^1$	1.6	+233	+19 49	94 23	2 31	
e	+33.5	-311	-1 48	137 21	45 29	
$e^1$	34.9	-306	-1 1	138 41	46 49	b <sup>2</sup>
$e^2$	35.3	-336	-2 52	139 56	48 4	
$e^3$	37.4	-340	-2 40	142 20	50 28	c
$f^{\text{s}}$	35.7	-451	-9 7	144 22	52 30	
$f^{\text{n}}$	36.6	-434				
$f^1$	37.5	-456	-9 41	146 24	54 32	
$f^2$	38.4	-465	-10 4	147 54	56 2	
g	42.1	-537	-14 0	156 27	64 35	
$g^1$	43.0	-549	-14 40	158 35	66 43	
August 29 23 <sup>h</sup> 15 <sup>m</sup>						
$a^{\text{ns}}$	-46.0	+420	+13 49	40 47	350 18	a
$a^{\text{n}}$	44.8	+440				
$a^1$	45.4	+528	+18 50	33 48	343 19	b <sup>2</sup>
b	7.2	-132	-2 19	95 11	44 42	
$b^1$	6.2					
$b^2$	5.5	-123	-1 26	95 57	45 28	
$b^3$	4.1	-157	-2 55	97 50	47 21	
$b^4$	3.7	-144	-2 3	97 56	47 27	
$c^1$	1.5	-144	-1 22	99 42	49 13	b <sup>3</sup>
$c^2$	5.6	-286	-10 50	99 22	48 53	
$c^3$	2.2	-331	-12 25	102 12	52 43	$c^1$
August 31 0 <sup>h</sup> 38 <sup>m</sup>						
a	-52.4	+535	+14 20	14 1	352 24	a <sup>1</sup>
b	33.3	+44	-1 30	66 1	44 24	
$b^1$	33.2	+30	-2 41	66 36	44 59	
$b^2$	33.0	+37	-2 15	66 35	44 58	
$b^3$	31.1	+30	-1 53	68 35	46 58	
$c^1$	32.6	-100	-9 44	69 56	48 19	
$c^{\text{ns}}$	30.5	-102				a
$c^{\text{s}}$	29.2	-118	-9 14	72 44	51 7	
$c^2$	28.3	-75	-6 40	73 29	51 52	
$c^3$	27.7	-169	-11 49	75 54	54 17	
$d_1$	+43.7	-532	-12 9	154 12	132 35	
$d_2$	43.7	-539	-12 38	154 40	133 3	
$d^1$	45.3	-524	-11 24	156 16	134 39	b <sup>2</sup>
e	46.0	-175	+9 53	143 42	122 5	
$e^1$	46.5	-168	+10 22	144 8	122 31	
f	52.3	-526	-11 8	172 36	150 59	
September 3 0 <sup>h</sup> 21 <sup>m</sup>						
$a^{\text{ns}}$	-57.6	+134	-8 59	30 11	50 30	a
$a^{\text{s}}$		+118				
$a^1$	57.8	+252	-2 37	24 17	44 36	
b	+10.2	-405	-12 33	111 8	131 27	
$b^1$	10.6	-388	-11 24	111 0	131 19	
$b^2$	11.2	-403	-12 8	111 54	132 13	
$c^1$	10.7	-37	+8 38	102 46	123 5	a <sup>1</sup>
$c^2$	12.2	+34	+13 4	102 34	122 53	
c	15.0	+41	+14 20	104 52	125 11	
d	17.7	-444	-12 35	118 56	139 15	
$e_1$	25.2	-12	+14 25	115 14	135 33	
$e_2$	25.6	-12	+14 32	115 37	135 56	
$e^1$	29.8	-3	+16 15	119 33	139 52	c <sup>1</sup>
$f^1$	25.8	-471	-11 54	127 25	147 44	
$f^2$	27.8	-468	-11 11	129 18	149 37	
$f^3$	29.3	-487	-11 55	131 37	151 56	
$f^4$	30.8	-532	-14 20	135 7	155 26	
$f^5$	33.5	-533	-13 43	138 10	158 29	
$f^6$	33.8	-489	-10 54	136 31	156 50	a <sup>10</sup>
September 5 1 <sup>h</sup> 11 <sup>m</sup>						
a	-16.7	-233	-11 40	82 22	131 15	a
$a^1$	14.9	-215	-9 56	83 33	132 26	$a^1$

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1862 September 5—Continued						
$a^2$	-14 <sup>s</sup> 9	-242''	-11° 30'	84° 9'	133° 2'	$a^2$
$a^3$	11.9	-252	-10 59	86 52	135 45	
$a^4$	11.9	-268	-11 55	87 14	136 7	$b$
$a^5$	1.1	-309	-10 29	97 13	146 6	
$a^6$	1.1	-327	-11 32	97 40	146 33	$b^4$
$a^7$	+1.7	-542	-23 49	106 7	155 0	
$a^8$	2.5	-364	-12 29	101 38	150 31	$d^1$
$a^9$	4.5	-343	-10 35	102 46	151 39	
$a^{10}$	6.0	-418	-14 32	106 4	154 57	$d$
$a^{11}$	7.9	-435	-14 56	108 12	157 5	
$a^{12}$	9.1	-384	-11 29	107 46	156 39	$c$
$b$	-14.3	+208	+13 35	73 48	122 41	
$b^1$	11.6	+213	+14 51	75 58	124 51	$c$
$c$	1.8	+146	+14 41	85 2	133 55	
$c^1$	+2.8	+141	+16 0	90 4	138 47	$d$
$c^2$	4.4	+98	+14 9	92 26	141 19	
$d$	52.5	-107	+16 5	146 54	195 47	$d^1$
$d^1$	53.0	-84	+17 33	147 25	196 18	
September 7 1 <sup>h</sup> 44 <sup>m</sup>						
$a$	-40.4	-58	-11 29	54 35	131 52	$a^1$
$a^1$	39.9	-46	-10 33	54 55	132 12	
$a^2$	37.3	-91	-11 57	58 35	135 52	$a^1$
$a^3$	36.4	-84	-11 10	59 21	136 38	
$a^4$	35.5	-114	-12 31	60 49	138 6	$b_2$
$b^{\text{ns}}$	28.8	-128	-10 43	68 7	145 24	
$b^{\text{s}}$	27.9	-142	-10 43	68 7	145 24	$b^1$
$b^1$	26.2	-179	-12 22	71 1	148 18	
$b^2$	24.9	-125	-8 46	71 2	148 19	$b^3$
$b^3$	23.0	-156	-9 46	73 23	150 40	
$b^4$	21.4	-185	-10 48	75 26	152 43	$c$
$b^5$	18.8	-198	-10 32	77 58	155 15	
$c$	26.1	+320	+14 49	57 43	135 0	$c$
$c^1$	24.2	+303	+14 40	60 4	137 21	
$c^2$	21.3	+300	+15 40	62 47	140 4	$d^1$
$d^1$	20.5	-265	-15 5	77 55	155 12	
$d^{\text{ns}}$	18.2	-272	-14 50	80 15	157 32	$d$
$d^{\text{s}}$	18.2	-281	-14 50	80 15	157 32	
$e$	+43.8	-600	-15 9	153 28	230 45	$e^2$
September 9 0 <sup>h</sup> 51 <sup>m</sup>						
$a$	-56.5	+95	-11 12	27 25	132 15	$a$
$a^1$	55.4	+70	-12 0	30 9	134 59	
$b_1$	49.8	+23	-11 38	39 46	144 36	$a$
$b_2$	49.1	+31	-10 52	40 27	145 17	
$b^1$	47.9	-14	-12 46	43 1	147 51	$a^1?$
$b^2$	46.3	-12	-11 54	44 59	149 49	
$b^3$	44.3	-14	-11 3	47 24	152 14	$a^1?$
September 11 2 <sup>h</sup> 42 <sup>m</sup>						
$c$	-43 <sup>s</sup> 2	+466''	+14° 26'	30° 26'	135° 16'	$C$
$d_1$	41.4	-115	-15 35	52 53	157 43	
$d_2$	41.2	-121	-15 35	52 53	157 43	$C$
$e$	+23.6	-550	-16 35	123 4	227 54	
$e^1$	25.6	-554	-16 14	125 16	230 6	$C$
$e^2$	27.1	-543	-15 54	126 54	231 44	
September 11 2 <sup>h</sup> 42 <sup>m</sup>						
$a$	-61.0	+169	-10 45	11 43	145 32	$a$
$a^1$	59.4	+117	-12 18	18 32	152 21	
$b$	33.2	-149	-13 54	60 4	193 53	$a$
$b^1$	30.2	-153	-12 51	63 1	196 50	
$c_1$	3.9	-402	-16 50	91 48	225 37	$b$
$c_2$	3.6	-393	-16 11	91 49	235 38	
$c^1$	2.7	-388	-15 32	92 26	226 15	$b^3$
$c^2$	0.1	-439	-17 38	96 7	229 56	
$c^3$	+1.0	-397	-14 44	95 47	229 36	$b^3$
$c^4$	1.6	-411	-15 20	96 41	230 30	
$c^5$	2.3	-423	-15 41	97 53	231 42	$b^4$
$c^6$	3.0	-430	-15 59	98 27	232 16	
September 13 2 <sup>h</sup> 5 <sup>m</sup>						
$a$	-52.7	+17	-14 8	31 54	193 0	$a$
$a^1$	51.1	+10	-13 40	34 25	195 31	
$b^{\text{ns}}$	29.2	-226	-16 51	64 12	225 18	$a$
$b^{\text{s}}$	28.4	-235	-16 51	64 12	225 18	
$b^1$	25.8	-224	-15 11	66 50	227 56	$a^2$
$b^2$	24.6	-257	-16 36	68 38	229 44	
$b^3$	23.8	-256	-16 10	69 23	230 29	$a^4$
$b^4$	22.5	-263	-16 2	70 42	231 48	
$b^5$	22.5	-282	-17 8	71 7	232 13	$a^5$
$c$	+54.0	-297	+6 38	147 15	308 21	
September 15 23 <sup>h</sup> 55 <sup>m</sup>						
$a^{\text{ns}}$	-48.9	-40	-15 56	36 49	225 18	$a$
$a^{\text{s}}$	-48.9	-53	-15 56	36 49	225 18	
$a^1$	47.0	-77	-16 42	39 52	228 21	$a^1?$
$a^2$	45.4	-82	-16 10	42 0	230 29	
$a^3$	44.1	-37	-13 0	42 33	231 2	$a^3$
$a^4$	44.1	-82	-15 31	43 33	232 2	
$a^5$	43.6	-107	-16 43	44 34	233 3	$a^4$
$a^6$	42.9	-75	-14 34	44 44	233 13	
$b$	22.4	+511	+38 54	55 22	243 51	$c^2$
$c$	+36.3	-231	+6 28	119 19	307 48	
$d^1$	51.9	-518	-7 17	156 30	344 59	$c$
$d$	52.8	-510	-6 46	158 43	347 12	
$d^2$	54.7	-479	-4 44	161 53	350 22	$d^1$



Letter	<i>Δa</i>	<i>Δδ</i>	b	L	L'	Letter on next date
1862 September 15—Continued						
<i>d</i> <sub>n</sub> <sup>s</sup>	+55.9	-439'' -465	- 2° 56'	162° 51'	351° 20'	<i>d</i>
<i>e</i> <sub>n</sub> <sup>s</sup>	61.3	-161 -146	+16 8	158 28	346 57	<i>e</i>
September 17 0 <sup>h</sup> 6 <sup>m</sup>						
<i>a</i>	-61.0	+ 77	-16 35	9 50	226 30	<i>d</i> <sup>4</sup>
<i>a</i> <sup>1</sup>	59.6	+ 77	-15 33	13 40	230 20	
<i>a</i> <sup>2</sup>	59.6	+ 42	-17 29	14 35	231 15	
<i>a</i> <sup>3</sup>	59.0	+ 53	-16 26	15 51	232 31	
<i>a</i> <sup>4</sup>	58.3	+ 63	-15 28	17 2	233 42	
<i>b</i>	3.15	-253	- 7 53	83 3	299 43	
<i>b</i> <sup>1</sup>	+ 0.2	-278	- 8 4	86 20	303 0	
<i>c</i> <sup>1</sup>	37.9	-499	- 8 23	128 44	345 24	
<i>c</i> <sup>2</sup>	38.7	-501	- 8 17	129 54	346 34	
<i>c</i> <sup>3</sup>	38.7	-526	- 9 49	131 13	347 53	
<i>c</i> <sup>4</sup>	40.5	-526	- 9 22	133 35	350 15	<i>d</i> <sup>6</sup>
<i>c</i> <sub>n</sub> <sup>s</sup>	40.0	-511	- 7 57	132 19	348 49	<i>d</i>
<i>d</i> <sup>1</sup>	41.0	-495	- 6 11	136 26	353 6	<i>d</i> <sup>10</sup>
<i>d</i>	44.1	-488	- 4 14	136 57	353 37	
<i>e</i> <sub>n</sub> <sup>s</sup>	45.4	-461	+15 17	131 11	347 51	
<i>e</i> <sup>1</sup>	49.0	-151				<i>f</i>
<i>e</i> <sup>2</sup>	49.7	-132				
September 19 0 <sup>h</sup> 24 <sup>m</sup>						
<i>a</i> <sup>1</sup>	-60.6	+138	-13 23	6 48	251 42	<i>a</i> <sup>2</sup> ?
<i>a</i>	59.3	+171	-10 45	8 57	253 51	
<i>b</i> <sup>1</sup>	40.4	+404	+11 12	27 44	272 38	
<i>b</i>	38.1	+381	+11 9	31 27	276 21	
<i>c</i>	+ 6.9	+ 63	+13 3	81 23	326 17	
<i>c</i> <sup>1</sup>	7.8	+ 62	+13 18	82 7	327 1	
<i>d</i> <sup>1</sup>	12.9	-391	- 9 50	98 17	343 11	
<i>d</i> <sup>2</sup>	13.8	-374	- 8 33	98 29	343 23	
<i>d</i> <sup>3</sup>	15.2	-402	- 9 39	100 40	345 34	
<i>d</i> <sup>4</sup>	16.7	-386	- 8 13	101 25	346 19	
<i>d</i> <sup>5</sup>	17.8	-351	- 5 50	101 17	346 11	<i>b</i> <sup>1</sup>
<i>d</i> <sub>n</sub> <sup>s</sup>	18.3	-361	- 6 32	102 42	347 36	
<i>d</i> <sup>6</sup>	19.3	-377	- 8 40	104 24	349 18	
<i>d</i> <sup>7</sup>	19.3	-409	- 5 15	105 2	349 56	
<i>d</i> <sup>8</sup>	21.6	-363	- 3 9	105 3	349 57	
<i>d</i> <sup>9</sup>	23.2	-340	- 5 18	107 0	351 54	
<i>d</i> <sup>10</sup>	23.7	-370	- 3 18	106 26	351 20	
<i>d</i> <sup>11</sup>	24.7	-356	- 3 50	107 35	352 29	
<i>d</i> <sup>12</sup>	25.6	-319	- 1 27	107 20	352 14	
<i>e</i>	14.6	+ 63	+15 52	87 57	332 51	<i>a</i> <sup>5</sup>
<i>e</i> <sup>1</sup>	15.8	+ 52	+15 41	89 13	334 7	<i>a</i> <sup>6</sup>

Letter	<i>Δa</i>	<i>Δδ</i>	b	L	L'	Letter on next date
<i>f</i> <sub>n</sub> <sup>s</sup>	-28.2	- 2''	+16° 37'	102° 38'	347° 32'	<i>c</i>
<i>f</i> <sup>1</sup>	29.3	- 23	+12 53	106 16	351 10	<i>e</i> <sup>2</sup> ?
<i>g</i> <sub>n</sub> <sup>s</sup>	30.7	- 91	-12 50	147 54	32 48	
<i>g</i> <sup>1</sup>	46.1	-609	-12 37	150 11	35 5	
<i>g</i> <sub>n</sub> <sup>s</sup>	46.7	-593	-10 4	148 52	33 46	
<i>g</i> <sup>2</sup>	46.9	-610	- 8 18	145 19	30 13	
<i>g</i> <sub>n</sub> <sup>s</sup>	47.8	-588	- 9 38	153 51	38 45	
<i>g</i> <sup>3</sup>	47.8	-581	+ 5 56	135 7	20 1	
<i>g</i> <sub>n</sub> <sup>s</sup>	47.8	-548	+ 5 47	137 20	22 14	
<i>g</i> <sup>4</sup>	47.9	-542				
<i>g</i> <sub>n</sub> <sup>s</sup>	48.6	-534				
<i>h</i>	50.1	-559				<i>d</i>
<i>h</i> <sup>1</sup>	50.9	-310				
<i>h</i> <sup>2</sup>	50.0	-317				
<i>h</i> <sup>3</sup>	51.2	-317				
<i>h</i> <sup>4</sup>						
<i>h</i> <sup>5</sup>						
<i>h</i> <sup>6</sup>						
<i>h</i> <sup>7</sup>						
<i>h</i> <sup>8</sup>						
<i>h</i> <sup>9</sup>						
<i>h</i> <sup>10</sup>						
<i>h</i> <sup>11</sup>						
<i>h</i> <sup>12</sup>						
September 21 0 <sup>h</sup> 14 <sup>m</sup>						
<i>a</i>	-20.5	+265	+12 50	50 45	323 37	<i>a</i> <sup>1</sup>
<i>a</i> <sup>1</sup>	19.4	+251	+12 34	52 10	325 2	<i>a</i> <sup>3</sup>
<i>a</i> <sup>2</sup>	17.3	+233	+12 32	54 36	327 28	<i>a</i> <sup>5</sup>
<i>a</i> <sup>3</sup>	15.6	+226	+12 51	56 12	329 4	
<i>a</i> <sup>4</sup>	14.4	+247	+14 27	56 33	329 25	
<i>a</i> <sup>5</sup>	10.1	+235	+15 36	60 32	333 24	
<i>a</i> <sup>6</sup>	9.4	+224	+15 18	61 27	334 19	
<i>b</i> <sup>1</sup>	13.1	-200	- 8 55	69 48	342 40	
<i>b</i> <sup>2</sup>	12.8	-235	-10 46	70 53	343 45	
<i>b</i> <sub>n</sub> <sup>s</sup>	7.9	-199	- 7 3	74 32	347 24	
<i>b</i> <sup>3</sup>	7.1	-214	- 7 4	75 48	348 40	
<i>b</i> <sup>4</sup>	6.2	-216	- 2 45	75 26	348 18	
<i>b</i> <sup>5</sup>	4.6	-149	- 6 13	77 44	350 36	<i>b</i> <sup>2</sup>
<i>b</i> <sup>6</sup>	3.9	-217	- 3 24	77 18	350 10	
<i>b</i> <sup>7</sup>	3.0	-172	- 3 41	78 8	351 0	
<i>b</i> <sup>8</sup>	2.3	-182	- 5 28	79 19	352 11	
<i>b</i> <sup>9</sup>	1.9	-217	+16 17	75 5	347 57	
<i>c</i> <sub>n</sub> <sup>s</sup>	+ 3.7	+133	+ 5 18	106 37	19 29	
<i>c</i> <sup>1</sup>	4.7	+151	-12 48	118 10	31 2	
<i>d</i>	29.8	-224	-12 39	119 30	32 22	
<i>e</i> <sup>1</sup>	30.1	-541	-12 32	121 5	33 57	
<i>e</i> <sup>2</sup>	31.2	-544	- 8 49	117 4	29 56	
<i>e</i> <sup>3</sup>	32.5	-548	-11 41	119 46	32 38	<i>e</i> <sup>1</sup>
<i>e</i> <sup>4</sup>	31.2	-482	-10 43	121 50	34 42	
<i>e</i> <sup>5</sup>	32.0	-532	- 9 5	123 1	35 53	
<i>e</i> <sup>6</sup>	31.5	-528	-16 0	130 0	42 52	
<i>e</i> <sup>7</sup>	32.6	-508	-15 42	132 2	44 54	
<i>e</i> <sup>8</sup>	34.1	-528	-11 26	129 45	42 37	
<i>e</i> <sup>9</sup>	35.9	-508	-10 14	129 50	42 42	
<i>e</i> <sup>10</sup>	36.3	-620	- 9 16	132 21	45 13	
<i>e</i> <sup>11</sup>	37.6	-621				
<i>e</i> <sup>12</sup>	39.0	-560				
<i>e</i> <sup>13</sup>	39.8	-544				
<i>e</i> <sup>14</sup>	41.9	-537				

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date	Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1862 September 23 2 <sup>h</sup> 1 <sup>m</sup>													
$a$	-41.3	+408"	+10° 27'	22° 29'	324° 28'	$b^1?$	$e$	-20.9	-189"	-11° 45'	59° 5'	28° 53'	$d$
$a^1$	40.2	+447	+12 55	21 40	323 39		$e^1$ n	20.7	-136	- 8 47	58 33	28 21	$d^2$
$a^2$	39.0	+383	+10 21	26 22	328 21		$e^1$ s	19.6	-145	- 8 47	58 33	28 21	
$a^3$	39.0	+431	+12 44	23 55	325 54		$e^2$	19.0	-153	- 8 59	59 49	29 37	
$a^4$	36.1	+427	+13 56	27 21	329 20		$e^3$	17.6	-221	-12 10	62 41	32 29	
$a^5$	32.2	+415	+15 13	32 0	333 59		$e^4$	15.3	-223	-11 20	64 39	34 27	$d^3$
$b$ n		+ 2					$e^5$	15.3	-273	-14 13	66 18	36 6	$d^4$
$b$ s	33.8	- 9	- 7 11	44 51	346 50	$a$	$e^6$	13.6	-181	- 8 12	65 2	34 50	$d^5$
$b^1$	32.2	- 25	- 7 36	46 56	348 55		$e^7$	12.3	-283	-13 26	68 41	38 29	
$b^2$	29.5	+ 24	- 4 13	48 18	350 17		$e^8$	11.5	-244	-10 54	68 20	38 8	
$b^3$	29.1	- 12	- 5 31	49 27	351 26		$e^9$	10.0	-367	-17 19	72 50	42 38	$d^7$
$c^1$	21.9	+363	+17 13	43 54	345 53		$e^{10}$	8.1	-246	- 9 36	71 12	41 0	
$c$ s	21.2	+324					$e^{11}$ n	8.1	-349	-15 44	74 54	44 42	$d^9$
$c$ n	20.2	+340	+16 7	46 10	348 9	$c$	$e^{11}$ s	6.5	-370				
$c^2$	17.9	+333	+17 23	48 34	350 33		$e^{12}$ n	7.2	-255	-10 7	72 40	42 28	$d^8$
$d$	+ 3.3	- 53	+ 6 25	76 48	18 47	$d^2$	$e^{12}$ s	6.5	-273				
$d^1$	9.2	- 95	+ 5 17	83 10	25 9		$e^{13}$	3.6	-248	- 7 57	74 51	44 39	$d^{11}$
$e$ n	3.7	-379					$e^{14}$	2.3	-308	-11 20	76 26	46 14	
$e$ s	5.4	-410	-13 3	87 30	29 29	$e_1$	$f$	+ 9.7	+100	+15 57	76 41	46 29	
$e^1$	5.8						$f^1$	11.9	+ 93	+16 25	78 46	48 34	
	6.7	-340	- 9 17	87 16	29 15	$e^1$	$f^2$	14.0	+ 88	+16 56	80 43	50 31	
$e^2$	6.2	-390	-12 9	88 45	30 44		$g$	45.0	-633	-14 36	142 36	112 24	$i$
$e^3$	8.5	-399	-11 48	90 57	32 56	$e^3$	September 27 0 <sup>h</sup> 21 <sup>m</sup>						
$e^4$	9.1	-347	- 8 40	89 52	31 51		$a$	-60.2	+293	- 6 34	350 29	347 38	
$e^5$	9.9	-359	- 9 0	90 53	32 52		$b$	46.6	+615	+16 35	353 3	350 12	
$e^6$	9.9	-465	-15 9	94 18	36 17	$e^5$	$c$	43.0	+329	+ 5 26	20 34	17 43	
$e^7$	10.5	-399	-11 5	92 35	34 34	$e^4$	$d^1$	42.5	+ 58	- 8 17	30 41	27 50	
$e^8$	10.9	-422	-12 3	94 8	36 7		$d^2$	42.5	+ 44	- 9 2	31 4	28 13	
$e^9$	14.5	-440	-11 59	97 23	39 22	$e^8$	$d$ n	43.3	+ 16				
$e^{10}$	14.5	-523	-16 55	100 26	42 25	$e^9$	$d$ s	41.3	- 21	-11 27	32 28	29 37	
$e^{11}$ s	16.6	-534					$d^3$	38.0	- 48	-11 51	38 6	35 15	
$e^{11}$ n	18.4	-518	-16 1	103 15	45 14	$e^{11}$	$d^4$	38.0	- 81	-13 40	38 52	36 1	
$e^{12}$ n	17.2	-429					$d^5$	37.2	- 9	- 9 21	37 56	35 5	
$e^{12}$ s	18.6	-443	-10 33	100 12	42 11	$e^{12}$	$d^6$	37.1	- 43	-11 10	38 53	36 2	
$e^{13}$	21.3	-424	- 8 40	102 51	44 50	$e^{13}$	$d^7$	34.8	-171	-17 11	44 7	41 16	
$e^{14}$	25.0	-478	-10 34	108 17	50 16		$d^8$	31.4	- 67	- 9 50	44 58	42 7	
September 25 1 <sup>h</sup> 36 <sup>m</sup>							$d^9$ n		-171				
$a$	-52.3	+176	- 6 59	16 27	346 15	$a$	$d^9$ s	31.3	-183	-15 54	47 42	44 51	
$b$	50.3	+553	+11 46	354 2	323 50		$d^{10}$	29.3	-208	-12 43	55 7	52 16	
$b^1$	49.3	+569	+13 7	354 35	324 23		$d^{11}$	27.9	- 53	- 7 30	47 47	44 56	
$b^2$	49.0	+533	+11 55	0 5	329 53		$e$	19.4	+473	+23 46	37 24	34 33	
$c^1$	39.4	+508	+16 5	16 59	346 47		$f$	3.7	- 39	+ 2 53	66 41	63 50	
$c$ s	38.8	+492					$f^1$	1.5	- 41	+ 3 45	69 24	66 33	
$c$ n	37.9	+508	+16 14	18 47	348 35	$b$	$f^2$	0.8	- 86	+ 1 53	71 0	68 9	$a^1$
$c^2$	37.6	+537	+18 26	17 13	347 1		$g$	+23.3	+ 46	+18 2	88 3	85 12	
$d^1$	24.0	+ 93	+ 2 3	49 8	18 56		$g^1$	24.0	+ 32	+17 31	89 1	86 10	
$d$	22.8	+148	+ 5 26	48 33	18 21	$c$	$g^2$	26.4	+ 48	+19 15	90 56	88 5	
$d^2$	21.5	+156	+ 6 37	49 24	19 12		$h^1$	26.4	-120	+10 1	94 48	91 57	
							$h$	29.3	-137	+10 4	97 58	95 7	$c^1$
							$h^2$	30.3	-127	+10 57	98 41	95 50	$d^?$

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1862 September 27—Continued						
<i>i</i>	+31 <sup>s</sup> 5	-576''	-14° 11'	115° 43'	112° 52'	$d^1?$ $d^3$
$i^1$	33.1	-566	-13 6	116 54	114 3	
$i^2$	35.3	-613	-15 22	122 31	119 40	
$i^3$	39.5	-681	-18 48	134 54	132 3	
October 3 3 <sup>h</sup> 12 <sup>m</sup>						
$a^1$	-56.6	+425	+ 1 30	344 12	67 13	$a$  $a^2$
<i>a</i>	54.5	+428	+ 3 12	356 36	73 37	
<i>b</i>	45.4	+441	+ 9 15	5 51	88 52	
$b^1$	44.9	+450	+ 9 46	6 2	89 3	
<i>c</i>	42.3	+423	+ 9 50	11 1	94 2	
$c^1$	41.6	+430	+11 16	11 25	94 26	
$d^{\text{n}}$	42.8	- 14	-13 3	27 41	110 42	
$d^{\text{s}}$	41.1	- 42				
$d^1$	39.8	- 23	-11 45	29 49	112 50	
$d^2$	37.0	- 70	-12 59	33 48	116 49	
$d^3$	36.4	- 95	-14 4	35 0	118 1	
$e^1$	20.9	+226	+ 9 43	39 50	122 51	
<i>e</i>	18.8	+231	+10 53	41 26	124 27	
October 5 23 <sup>h</sup> 51 <sup>m</sup>						
$a^{\text{n}}$	-57.3	+123	-13 36	2 0	111 7	$b^1$  $b^5$
$a^{\text{s}}$	56.4	+ 98				
$a^1$	55.7	+ 86	-14 14	4 44	113 51	
$a^2$	53.7	+ 44	-15 22	9 9	118 16	
<i>b</i>	+38.2	+ 86	+25 25	94 14	203 21	
$b^1$	39.2	+ 83	+25 34	95 23	204 30	
$b^2$	42.2	+ 77	+26 16	99 6	208 13	
$b^3$	43.3	+ 75	+26 33	100 35	209 42	
$b^4$	44.4	+114	+29 11	101 27	210 34	
$b^5$	47.1	- 26	+21 58	107 8	216 15	
$b^6$	48.7	- 9	+23 26	109 5	218 12	
October 7 0 <sup>h</sup> 5 <sup>m</sup>						
$a_1$	-22.3	+289	+12 8	32 43	170 3	$a$  $a^1$
$a_2$	21.8	+299	+12 52	32 47	170 7	
$a^1$	20.9	+273	+11 56	34 31	171 51	
$a^2$	18.1	+257	+12 18	37 23	174 43	
$b^1$	+15.2	+241	+25 19	65 45	203 5	
<i>b</i>	17.2	+216	+24 42	68 10	205 30	
$b^2$	18.8	+230	+26 9	69 20	206 40	
$b^3$	19.5	+190	+24 10	70 58	208 18	
$b^4$	21.8	+197	+25 29	72 56	210 16	
$b^5$	22.7	+223	+27 17	73 8	210 28	
$b^6$	24.2	+230	+28 19	74 29	211 49	
$c^1$	29.7	+ 70	+21 20	83 23	220 43	
Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
<i>c</i>	+31 <sup>s</sup> 6	+ 78''	+22° 29'	85° 8'	222° 28'	$b$
<i>d</i>	62.6	-182	+16 16	140 53	278 13	
October 12 23 <sup>h</sup> 52 <sup>m</sup>						
$a^{\text{s}}$	-35.7	+641	+24 9	355 43	203 5	$a$  $a^2$  $b$
$a^{\text{n}}$	34.6	+655				
$a^1$	29.6	+644	+26 50	2 36	209 58	
$a^2^{\text{s}}$	27.3	+626	+27 33	6 41	214 3	
$a^2^{\text{n}}$	26.3	+635				
$a^3$	26.8	+639	+27 59	6 1	213 23	
$a^4$	25.3	+655	+29 36	6 19	213 41	
<i>b</i>	+22.2	+ 34	+16 12	72 3	279 35	
October 15 1 <sup>h</sup> 53 <sup>m</sup>						
$a^1$	- 9.0	+132	+ 9 5	40 49	291 28	$a$  $b$  $c$
$a^2$	8.5	+118	+ 8 31	41 35	292 14	
<i>a</i>	7.4	+102	+ 8 8	42 54	293 33	
$b^1$	+39.1	- 21	+18 55	86 34	337 13	
<i>b</i>	43.0	- 75	+17 14	92 11	342 50	
$b^2$	44.8	- 82	+17 25	94 24	345 3	
<i>c</i>	51.9	-561	- 8 26	130 5	20 44	
October 18 0 <sup>h</sup> 38 <sup>m</sup>						
$a^1$	-42.2	+424	+ 9 37	357 17	289 19	$b$  $c^1$ $c^3$ $d$
$a^2$	41.8	+430	+10 7	357 31	289 33	
<i>a</i>	41.3	+394	+ 8 34	359 54	291 56	
<i>b</i>	+ 5.4	+160	+16 2	49 6	341 8	
$b^1$	7.2	+151	+16 15	50 19	342 21	
$b^2$	8.4	+153	+16 48	51 11	343 13	
$b^3$	11.7	+139	+17 21	54 20	346 22	
$b^4$	13.7	+128	+17 32	56 18	348 20	
$c^{\text{s}}$	32.8	-478	- 8 8	90 59	23 1	
$c^{\text{n}}$	33.8	-462				
$d^1$	37.8	-597	-14 9	102 54	34 56	
<i>d</i>	38.3	-592	-13 42	103 13	35 15	
<i>e</i>	45.3	-364	+ 1 36	100 13	32 15	
October 20 0 <sup>h</sup> 25 <sup>m</sup>						
<i>a</i>	-40.1	+301	+ 4 27	3 22	323 20	$a$  $a^3$ $b^2$
$a^1$	38.3	+302	+ 5 20	5 13	325 11	
$b^{\text{s}}$	+ 9.2	-327	- 8 53	63 8	23 6	
$b^{\text{n}}$	10.2	-336				
$b^1$	10.2	-258	- 4 41	61 25	21 23	
<i>c</i>	15.6	-450	-13 24	71 50	31 48	
$c^1$	17.4	-473	-14 2	74 15	34 13	
$c^2$	18.7	-453	-12 25	74 38	34 36	
$c^3$	19.2	-469	-13 10	75 37	35 35	



Letter	4a	4δ	b	L	L'	Letter on next date	Letter	4a	4δ	b	L	L'	Letter on next date
1862 October 20—Continued							October 31 0 <sup>h</sup> 19 <sup>m</sup>						
c <sup>4</sup>	+19.56	−476''	−13° 25'	76° 17'	36° 15'	b <sup>3</sup>	a <sup>1</sup>	−58.7	− 5''	−19° 35'	338° 14'	92° 31'	
d	24.5	−240	+ 1 26	72 49	32 47	c	a <sup>2</sup>	57.3	− 42	−21 0	341 15	95 32	
October 23 0 <sup>h</sup> 26 <sup>m</sup>							a <sup>3</sup>	55.8	+ 26	−16 25	342 33	96 50	
a <sup>1</sup>	−31.5	− 91	−12 19	20 16	22 20		a	55.1	+ 10	−16 58	343 56	98 13	
a <sup>n</sup>		− 28	− 8 35	20 3	22 7		a <sup>4</sup>	54.8	− 9	−17 39	344 41	98 58	
a <sup>s</sup>	30.1	− 37					b <sup>n</sup>	47.4	− 9	−14 51	355 14	109 31	a
a <sup>2</sup>	28.9	− 44	− 8 42	21 24	23 28		s	46.3	− 28				
a <sup>3</sup>	28.5	+ 16	− 5 21	20 14	22 18		b <sup>1</sup>	43.7	− 68	−16 14	359 44	114 1	b
a <sup>4</sup>	27.9	− 77	−10 3	23 5	25 9		c	28.8	+237	+ 6 1	5 59	120 16	
a <sup>5</sup>	26.8	− 53	− 8 19	23 27	25 31		c <sup>1</sup>	28.6	+199	+ 4 8	7 23	121 40	
b	25.5	−165	−13 52	27 16	29 20		c <sup>2</sup>	23.8	+216	+ 6 51	10 54	125 11	
b <sup>1</sup>	23.9	−158	−12 48	28 29	30 33		c <sup>3</sup>	22.5	+186	+ 5 47	12 53	127 10	
b <sup>2</sup>	22.9	−178	−13 28	29 51	31 55		d	22.5	+518	+23 28	0 32	114 49	c
b <sup>3</sup>	17.8	−207	−12 59	34 48	36 52	a?	e	19.2	−343	−21 50	28 38	142 55	
c	15.1	+ 46	+ 1 38	30 31	32 35		e <sup>1</sup>	17.7	−363	−22 25	30 25	144 42	
d <sup>s</sup>	+43.0	−610					e <sup>2</sup>	15.8	−340	−20 17	31 27	145 44	
d <sup>n</sup>	44.0	−602	−13 41	106 19	108 23	d	e <sup>3</sup>	12.5	−361	−20 13	34 44	149 1	
e	62.0	− 46	+23 12	113 49	115 53	e <sub>1</sub> e <sub>2</sub>	f <sup>1</sup>	+ 3.2	−274	− 9 24	44 59	159 16	
e <sup>1</sup>	62.0	− 51	+22 58	113 57	116 1	e <sup>3</sup>	f	5.5	−269	− 8 19	46 39	160 56	
October 28 23 <sup>h</sup> 51 <sup>m</sup>							f <sup>2</sup>	8.2	−315	− 9 36	49 44	164 1	
a	−63.0	+166	−13 3	326 19	38 13		f <sup>3</sup>	9.6	−322	− 9 48	51 23	165 40	
b	54.6	+169	− 8 31	343 7	55 1		g	20.4	−251	− 2 8	58 11	172 28	d <sup>2</sup>
b <sup>1</sup>	53.6	+157	− 8 40	344 59	56 53		h	28.3	−283	− 1 19	65 54	180 11	d
b <sup>2</sup>	51.9	+134	− 9 4	348 6	60 0		h <sup>1</sup>	30.1	−269	+ 0 1	67 5	181 22	
b <sup>3</sup>	51.5	+141	− 8 31	348 26	60 20		i	35.8	−375	− 4 0	75 53	190 10	d <sup>3</sup>
c	28.8	−228	−19 17	20 50	92 44	a <sup>1</sup>	k	52.8	+ 44	+24 33	85 32	199 49	e
c <sup>1</sup>	24.4	−251	−18 28	25 9	97 3		November 2 0 <sup>h</sup> 5 <sup>m</sup>						
d <sup>n</sup>	11.7	−265					a	−61.7	+104	−14 48	328 7	110 20	
d <sup>s</sup>	9.3	−290	−14 23	37 24	109 18	b	b	48.3	+384	+ 5 53	338 24	120 37	
e <sub>1</sub>	+13.1	+261	+23 32	42 35	114 29		c	38.5	+658	+24 13	332 11	114 24	
e <sub>2</sub>	13.5	+263	+23 48	42 53	114 47	d	d	8.1	− 58	− 1 57	28 43	170 56	b <sup>1</sup>
e <sub>3</sub>	14.2	+254	+23 31	43 38	115 32		d <sup>1</sup>	2.6	− 72	− 0 44	33 20	175 33	b
e <sup>1</sup>	17.0	+249	+24 20	46 17	118 11		d <sup>2</sup>	+ 0.7	− 98	− 0 57	36 31	178 44	b <sup>2</sup>
e <sup>2</sup>	18.4	+233	+23 56	47 51	119 45		d <sup>3</sup>	10.1	−218	− 4 12	46 52	189 5	
f <sub>1</sub>	14.1	− 53	+ 6 44	51 1	122 55		e	32.8	+174	+25 0	57 39	199 52	
f <sub>2</sub>	14.5	− 48	+ 7 10	51 16	123 10		November 4 0 <sup>h</sup> 37 <sup>m</sup>						
f <sup>1</sup>	15.9	− 89	+ 5 28	53 25	125 19	c <sup>3</sup>	a	−38.2	+536	+18 12	340 25	151 1	
g	17.9	−576	−21 19	71 1	142 55	e	a <sup>1</sup>	37.2	+531	+18 21	341 51	152 27	
g <sup>1</sup>	20.1	−592	−21 13	73 22	145 16	e <sup>2</sup>	a <sup>2</sup>	36.2	+509	+17 35	344 12	154 48	
g <sup>2</sup>	21.9	−610	−21 41	75 58	147 52		a <sup>3</sup>	34.8	+527	+19 6	344 37	155 13	
g <sup>3</sup>	23.1	−596	−20 24	76 19	148 13	e <sup>3</sup>	b <sup>1</sup>	35.2	+129	− 1 59	359 37	170 13	
h	40.0	−494	− 8 52	88 44	160 38		b	31.7	+115	− 1 26	3 7	173 43	
h <sup>1</sup>	43.2	−496	− 8 1	92 50	164 44	F	b <sup>2</sup>	26.3	+ 87	− 0 54	8 34	179 10	
i	52.9	−429	− 1 35	103 40	175 34	g	b <sup>3</sup>	25.4	+119	+ 1 7	8 27	179 3	
i <sup>1</sup>	56.0	−427	− 0 47	110 3	181 57	h	c	23.1	+391	+16 22	1 55	172 31	

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1862 November 4—Continued						
$d$	-21.9	-80"	-8° 15'	16° 12'	186° 48'	
$d^1$	16.7	-119	-8 28	21 20	191 56	
$d^2$	15.0	-131	-8 30	22 58	193 34	
$e^s$	+42.4	-625	-16 57	93 0	263 36	$a$
$e^n$	43.4	-614				
$f$	47.5	-656	-18 15	106 38	277 14	$a^1$
November 11 0 <sup>h</sup> 10 <sup>m</sup>						
$a$	-37.6	-130	-16 46	356 3	264 37	$a$
$a^1$	25.2	-250	-19 12	9 41	278 15	
$a^2$	10.4	-324	-18 22	23 44	292 18	$b^1$
$b^n$	14.0	+169	+7 27	10 9	278 43	$c_1, c_2$
$b^s$	13.2	+158				
$b^1$	9.2	+155	+8 26	13 50	282 24	
$b^2$	8.7	+121	+6 45	15 3	283 37	
$b^3^n$	7.1	+119	+7 4	16 51	285 25	$c$
$b^3_s$	6.2	+109				
$c$	+25.5	+118	+17 34	42 48	311 22	
$c^1$	25.7	+98	+16 31	43 24	311 58	
$c^2$	29.1	+95	+17 25	46 31	315 5	
November 14 0 <sup>h</sup> 37 <sup>m</sup>						
$a$	-64.1	+28	-17 33	314 19	265 15	$a^1$
$b$	50.8	-54	-17 0	337 21	288 17	$a^2$
$b^1$	48.6	-94	-18 30	340 35	291 31	
$b^2$	44.8	-168	-21 24	346 2	296 58	
$c_1^1$	47.8	+371	+7 8	329 6	280 2	$b$
$c_2^1$	47.5	+384	+7 56	328 52	279 48	
$c$	44.1	+327	+6 4	335 12	286 8	$b^1$
$d_1^1$	+16.0	+164	+16 37	30 51	341 47	$c_2^1$
$d_2^1$	16.6	+145	+15 44	31 44	342 40	$c_1^1$
$d_3^1$	17.9	+166	+17 18	32 25	343 21	
$d^n$	19.7	+133				
$d^s$	20.7	+117	+15 42	35 8	346 4	$c$
$d^2$	22.7	+168	+18 54	36 30	347 26	
$e$	30.8	-453	-13 14	58 42	9 38	$d$
$f^1$	35.9	+131	+20 51	49 24	0 20	
$f$	37.9	+130	+21 24	51 26	2 22	
$g^s$	53.1	-462				
$g^n$	54.0	-471	-7 51	87 7	38 3	$c$
November 15 0 <sup>h</sup> 18 <sup>m</sup>						
$a^1$	-59.6	+12	-16 22	322 49	287 36	
$a$	57.5	-21	-17 27	326 41	291 28	
$b$	54.8	+434	+8 7	314 33	279 20	
$b^1$	52.9	+383	+6 9	320 53	285 40	
Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
$c_1^1$	+1.7	+235"	+16° 0'	16° 45'	341° 32'	
$c_2^1$	1.7	+249	+16 47	16 26	341 13	
$c^2$	2.8	+193	+13 50	18 8	342 55	
$c^3$	3.2	+244	+16 59	17 45	342 32	
$c^s$	5.0	+190				
$c^n$	6.2	+207	+15 11	20 42	345 29	
$c^4$	5.9	+239	+17 32	20 3	344 50	
$d$	18.6	-372	-12 26	44 6	8 53	
$e^s$	46.1	-427				
$e^n$	47.0	-418	-7 24	73 9	37 56	$a$
November 25 23 <sup>h</sup> 58 <sup>m</sup>						
$a$	-67.0	+181	-6 34	293 9	38 4	
$b^s$	47.3	+392	+12 5	319 24	64 19	
$b^n$	45.9	+413				
$b^1$	45.9	+375	+9 51	322 5	67 0	
$b^2$	45.9	+341	+8 55	322 43	67 38	
$c^1$	40.0	+329	+9 59	329 25	74 20	
$c$	38.9	+349	+11 24	329 51	74 46	
$c^2$	37.0	+361	+12 37	331 22	76 17	
$d$	33.1	+343	+12 44	335 38	80 33	
$e^1$	17.9	-219	-14 27	0 18	105 13	
$e$	12.5	-218	-12 56	4 40	109 35	
$e^2$	8.0	-186	-9 19	7 52	112 47	
$e^3$	3.7	-215	-10 26	11 38	116 33	
November 30 1 <sup>h</sup> 31 <sup>m</sup>						
$a$	-68.4	-16	-16 38	289 22	105 22	
$a^1$	67.1	-44	-17 54	293 49	109 49	
December 5 23 <sup>h</sup> 42 <sup>m</sup>						
$a$	+66.1	-28	+11 46	69 13	314 19	$c$
December 8 0 <sup>h</sup> 22 <sup>m</sup>						
$a$	-23.5	-95	-10 1	339 43	267 19	
$b$	12.8	+181	+7 40	344 49	272 25	$a$
$b^1$	11.1	+201	+9 7	345 53	273 29	
$c$	+35.9	+114	+12 51	25 58	313 34	
December 11 0 <sup>h</sup> 38 <sup>m</sup>						
$a$	-53.1	+300	+8 3	301 18	271 10	$d$
$b$	+30.3	-383	-17 46	25 48	355 40	
$c$	61.7	-286	-6 33	60 34	30 26	$e^1$
$c^1$	62.5	-312	-7 53	63 35	33 27	$e$

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1862 December 12 0 <sup>h</sup> 36 <sup>m</sup>						
a	-18 <sup>s</sup> .2	+245''	+10° 25'	335° 43'	319° 36'	
a <sup>1</sup>	17.0	+247	+10 42	336 41	320 34	
a <sup>2</sup>	15.5	+245	+10 50	337 57	321 50	
b	+ 0.0	+311	+17 13	349 42	333 35	
c	4.2	+226	+12 51	354 8	338 1	
d	15.3	-333	-17 39	10 18	354 11	
e <sup>1</sup>	54.0	-263	- 7 3	46 46	30 39	C
e <sup>s</sup>	54.7	-297	- 8 36	48 37	32 30	
e <sup>n</sup>		-288				
f	63.7	+134	+17 46	57 56	41 49	d
g	70.7	+ 21	+12 27	79 28	63 21	e <sub>1</sub>

December 17 0 <sup>h</sup> 41 <sup>m</sup>						
a	-46.1	-108	-13 14	308 51	2 57	a
b	41.5	-209	-18 43	313 38	7 44	
c <sub>1</sub>	18.5	- 86	- 8 42	334 13	28 19	
c <sub>2</sub>	18.4	- 87	- 8 43	334 23	28 29	b
c <sub>3</sub>	17.5	- 88	- 8 42	335 6	29 12	
c <sup>1</sup>	16.1	- 55	- 6 38	335 58	30 4	
c <sup>2</sup>	14.7	- 64	- 6 58	337 11	31 17	C
c <sup>3</sup>	14.1	-133	-10 54	338 12	32 18	
c <sup>4</sup>	12.1	- 55	- 6 8	339 8	33 14	
c <sup>5</sup>	11.5	- 97	- 8 30	340 3	34 9	d
c <sup>6</sup>	2.1	-101	- 7 33	347 41	41 47	
d	2.6	+326	+17 17	343 6	37 12	
e <sup>n</sup>	+25.5	+189	+12 46	8 43	62 49	b
e <sub>1</sub>	26.6	+173				
e <sub>2</sub>	27.2	+170	+11 56	9 16	63 22	
e <sup>1</sup>	30.7	+167	+12 15	12 24	66 30	C
f <sup>1</sup>	51.5	-397	-17 29	42 50	96 56	
f <sup>2</sup>	52.5	-442	-19 59	46 26	100 32	
f <sup>3</sup>	52.9	-385	-16 32	44 17	98 23	d
f <sup>4</sup>	54.8	-376	-15 42	46 39	100 45	
f <sup>5</sup>	55.3	-335	-13 14	45 39	99 45	
f	58.5	-392	-16 2	53 38	107 44	

December 20 0 <sup>h</sup> 52 <sup>m</sup>						
a	-57.3	- 37	- 9 42	292 10	28 28	
b <sup>n</sup>	21.1	+284	+12 15	326 4	62 22	
b <sup>s</sup>	20.1	+271				
b <sup>1</sup>	18.2	+289	+13 9	327 59	64 17	
b <sup>2</sup>	12.5	+230	+10 14	333 22	69 40	
c <sup>s</sup>	+13.7	-253	-14 34	359 12	95 30	
c <sup>n</sup>	14.0	-239				
c <sup>1</sup>	16.1	-328	-19 16	1 47	98 5	
c <sup>2</sup>	17.0	-300	-17 29	2 7	98 25	
c <sup>3</sup>	17.4	-266	-15 25	2 1	98 19	
c <sup>4</sup>	18.2	-330	-19 8	3 35	99 53	

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
d	+29 <sup>s</sup> .6	-303''	-16° 8'	13° 17'	109° 35'	
e	57.1	-499	-24 5	55 52	152 10	

1863 January 18 0 <sup>h</sup> 48 <sup>m</sup>						
a <sup>1</sup>	+10.1	-121	-12 58	323 32	106 47	a <sup>1</sup> ?
a <sup>2</sup>	11.8	-197	-17 35	324 36	107 51	a <sub>2</sub>
a <sup>s</sup>	11.8	-165				
a <sup>n</sup>	13.1	-155	-15 27	325 20	108 35	a <sub>1</sub>
a <sup>3</sup>	15.0	-185	-17 8	327 29	110 44	a <sup>4</sup>
a <sup>4</sup>	16.0	-148	-15 1	328 26	111 41	a <sup>5</sup>
b	30.2	- 49	-10 11	341 21	124 36	b
b <sup>1</sup>	30.8	-110	-13 47	341 50	125 5	b <sup>1</sup>
b <sup>2</sup>	33.4	- 63	-11 10	344 16	127 31	
c	54.2	+281	+ 8 28	10 1	153 16	c
d <sup>n</sup>	53.7	+403	+15 47	13 45	157 0	d
d <sup>s</sup>	54.6	+392				
d <sup>1</sup>	57.5	+410	+16 45	20 19	163 34	

January 19 0 <sup>h</sup> 48 <sup>m</sup>						
a <sup>1</sup>	- 6.4	-162	-13 54	308 21	105 38	
a <sup>2</sup>	5.9	-196	-15 56	308 28	105 45	
a <sub>1</sub>	3.3	-180	-15 21	311 28	108 45	
a <sub>2</sub>	1.9					
a <sub>3</sub>	3.7	-210	-17 2	310 19	107 36	
a <sup>3</sup>	0.9	-148	-13 39	313 4	110 21	
a <sup>4</sup>	0.9	-217	-17 42	312 32	109 49	
a <sup>5</sup>	+ 1.0	-164	-14 46	314 30	111 47	a
b	14.5	- 67	-10 20	326 29	123 46	
b <sup>1</sup>	15.9	-115	-13 15	327 27	124 44	
b <sup>2</sup>	18.5	-160	-16 6	329 32	126 49	
c	42.7	+291	+ 8 53	355 21	152 38	
d <sup>n</sup>	43.8	+413	+16 8	359 54	157 11	c
d <sup>s</sup>	44.8	+405				
d <sup>1</sup>	51.7	+451	+18 49	11 28	168 45	c <sup>3</sup> ?

January 25 1 <sup>h</sup> 23 <sup>m</sup>						
a	-61.9	-379	-14 39	230 16	112 6	
b	43.5	-218	-10 48	266 50	148 40	
c <sup>s</sup>	39.5	+271				
c <sup>n</sup>	38.3	+279	+16 53	276 44	158 34	
c <sup>1</sup>	35.0	+211	+12 13	280 30	162 20	
c <sup>2</sup>	34.5	+295	+17 15	281 14	163 4	
c <sup>3</sup>	31.0	+322	+18 16	284 43	166 33	
c <sup>4</sup>	29.7	+313	+17 27	285 56	167 46	
d	+ 3.5	-122	-13 11	310 28	192 18	
d <sup>1</sup>	3.5	-133	-13 49	310 22	192 12	
d <sup>2</sup>	4.9	- 94	-11 44	311 54	193 44	
e	3.5	+352	+14 32	315 14	197 4	



Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1863 January 25—Continued						
$f$	+13 <sup>s</sup> .7	— 2''	— 7° 33'	320° 4'	201° 54'	A
$f^1$	15.8	+ 3	— 7 31	321 50	203 40	
$f^2$	17.2	+ 5	— 7 34	323 5	204 55	
$g$ <sub>n</sub>	58.9	+312	+ 7 6	12 43	254 33	$c_1c_2$
$h$	62.9	+383	+12 43	29 43	271 33	$e$
$i$	66.4	+122	— 3 31	24 32	266 22	$d$
January 30 0 <sup>h</sup> 42 <sup>m</sup>						
$a$ <sub>n</sub>	—54.2	—208	— 6 31	248 18	199 54	$a$
$a^1$	51.3	—235	— 8 30	251 36	203 12	$a^1$
$b$	23.0	+151	+ 6 51	286 18	237 54	$c$
$c$ <sub>n</sub>	6.0	+220	+ 7 24	301 21	252 57	
$c_1$		+211				
$c_2$	5.3	+207	+ 6 47	301 50	253 26	$c^1$
$c^1$	3.1	+216	+ 6 55	303 45	255 21	$c^2$
$c^2$	2.0	+207	+ 6 13	304 30	256 6	$c^4$
$c^3$	+ 0.3	+216	+ 6 21	306 30	258 6	
$c^4$	1.7	+220	+ 6 21	307 42	259 18	
$d$	10.7	+ 84	— 2 57	313 28	265 4	$d$
$d^1$	13.1	+ 26	— 6 34	314 50	266 26	$e^1?$
$d^2$	14.6	+ 69	— 4 24	316 31	268 7	$e^2$
$d^3$	16.2	+ 12	— 7 55	317 18	268 54	
$d^4$	21.4	+ 44	— 6 50	322 7	273 43	
$e$	15.0	+347	+12 4	318 59	270 35	$j$
$e^1$	17.9	+372	+12 53	323 35	275 11	$h$
$f$	49.6	— 12	—13 18	350 2	301 38	
$f^1$	51.7	0	—12 46	352 49	304 25	
January 31 1 <sup>h</sup> 55 <sup>m</sup>						
$a$	—60.6	—266	— 6 50	234 17	200 37	$a$
$a^1$	58.0	—291	— 8 46	236 22	202 42	
$b^1$	47.8	+218	+16 48	261 6	227 26	
$b$	46.5	+216	+16 20	262 36	228 56	$a$
$c$	22.0	+160	+ 7 17	286 16	252 36	
$c^1$	21.2	+158	+ 6 53	286 58	253 18	
$c^2$	19.3	+158	+ 6 34	288 34	254 54	$a$
$c^3$	15.3	+208	+ 8 41	292 30	258 50	
$c^4$	15.3	+169	+ 6 24	292 5	258 25	
$c^5$	14.3	+171	+ 6 20	292 56	259 16	$c$
$d$	5.0	+ 36	— 3 11	298 58	265 18	
$e$	5.5	— 41	— 7 28	297 35	263 55	
$e^1$	4.4	— 17	— 6 18	298 50	265 10	$e$
$e^2$	+ 0.3	— 39	— 8 23	302 20	268 40	
$e^3$	4.7	— 2	— 7 3	306 28	272 48	
$j$	— 3.3	+300	+11 51	303 37	269 57	$d$
$g$	+16.3	+ 72	— 4 41	317 0	283 20	
Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$h$	+35 <sup>s</sup> .9	— 28''	—13° 10'	333° 55'	300° 15'	$j$
$h^1$	39.2	— 14	—12 45	337 19	303 39	
February 2 0 <sup>h</sup> 21 <sup>m</sup>						
$a$	—46.9	+ 32	+ 5 58	259 10	252 40	$b$
$b$	34.7	—176	— 8 47	267 54	261 24	
$c$	33.9	— 81	— 3 39	270 28	263 58	
$d$	31.8	+183	+10 56	275 51	269 21	$a$
$d^1$	30.2	+104	+ 5 57	276 31	270 1	$c^1?$
$e$	28.9	—171	— 9 54	273 27	266 57	
$f^1$	+ 6.3	—127	—14 26	303 10	296 40	
$f^2$	7.7	—102	—13 29	305 45	299 15	$c^2$
$j$	10.0	—111	—14 25	307 36	301 6	
$g$	19.2	+403	+13 56	322 46	316 16	
February 4 2 <sup>h</sup> 0 <sup>m</sup>						
$a$	—55.9	+ 76	+11 54	245 44	268 16	$a$
$b$	55.4	—281	— 8 4	238 19	260 51	
$c$	28.7	—211	—11 52	270 29	293 1	
$c^1$	24.4	—201	—12 23	274 36	297 8	$a$
$c^2$	19.3	—197	—13 21	279 11	301 43	
$d$	10.1	+342	+15 34	294 55	317 27	
$e$	+59.7	— 5	—15 25	0 34	23 6	$e^6?e^7$
February 8 0 <sup>h</sup> 56 <sup>m</sup>						
$a$	—55.7	—401	—12 50	226 40	304 43	$b^1?$
$b$	46.1	—273	— 9 35	246 41	324 44	
$c$	31.0	—149	— 7 16	265 27	343 30	
$c^1$	27.1	—156	— 8 43	268 51	346 54	$b^2?$
$c^2$	26.0	—145	— 8 24	270 7	348 10	
$d$	27.7	—266	—14 39	265 43	343 46	
$d^1$	24.9	—277	—16 3	268 0	346 3	$b^3$
$e^1$	+ 4.3	— 59	—10 52	297 8	15 11	
$e^2$	5.3	— 31	— 9 31	298 25	16 28	
$e^3$	6.7	— 25	— 9 29	299 41	17 44	$b^4$
$e^4$	7.1	— 60	—11 32	299 27	17 30	
$e^5$	8.3	— 41	—10 43	300 47	18 50	
$e$	10.5	— 31	—10 37	302 44	20 47	$a$
$e^6$	13.2	—101	—15 11	304 7	22 10	
$e^7$	16.3	—103	—15 56	306 48	24 51	
$j$	47.8	+370	+ 6 13	346 21	64 27	
February 11 2 <sup>h</sup> 14 <sup>m</sup>						
$a$	—55.6	—443	—13 50	219 50	340 44	$a$
$a^1$	54.5	—400	—12 15	225 26	346 20	
$b$ <sub>n</sub>	38.8	—273	—10 49	252 13	13 7	
$b^1$	37.7	—252				$a$
$b^2$	36.9	—245	—10 17	254 6	15 0	
$b^3$	35.3	—204	— 8 32	256 48	17 42	
$b^4$	33.8	—219	— 9 49	257 51	18 45	

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1863 February 11—Continued						
$b^4$	-32.3	-216"	-10° 7'	259° 25'	20° 19'	
$b^5$	31.7	-179	- 8 15	260 51	21 45	
$b^6$	29.8	-149	- 7 10	263 19	24 13	
$b^7$	28.4	-156	- 7 57	264 26	25 20	
$b^8$	26.9	-129	- 6 54	266 22	27 16	
$b^9$	25.7	-144	- 8 5	267 10	28 4	
$c_1$	+50.5	+ 87	-11 40	340 54	101 48	
$c_2$	51.1	+ 80	-12 9	341 37	102 31	
$c^1$	53.4	+102	-11 10	345 9	106 3	
$c^2$	54.3	+ 72	-13 0	346 8	107 2	
$c^3$	54.8	+100	-11 25	347 12	108 6	$c^3$
$d^1$	55.9	- 25	-18 49	347 57	108 51	
$d^2$	56.6	- 2	-17 31	349 9	110 3	$d^2?$
$d^{\text{n}}$	56.9	+ 39	-15 37	349 53	110 47	$d$
$d^3$	63.0	+ 30	-14 53	2 21	123 15	
$d^4$	64.3	+ 25	-16 6	6 23	127 17	
February 14 2 <sup>h</sup> 1 <sup>m</sup>						
$a$	-57.6	-421	-10 35	212 53	15 46	$a$
$b$	+ 9.1	+262	+ 5 39	300 31	103 24	
$b^1$	12.6	+276	+ 5 38	303 44	106 37	
$c^{\text{n}}$	12.0	- 51	-13 6	297 53	100 46	$b$
$c^{\text{s}}$	13.0	- 60				
$c^1$	16.4	- 30	-12 35	301 39	104 32	
$c^2$	17.4	+ 41	- 8 49	303 38	106 31	
$c^3$	18.5	+ 5	-11 5	303 59	106 52	$b^1$
$c^4$	19.7	+ 30	- 9 57	305 25	108 18	
$d^1$	21.0	- 74	-16 9	305 5	107 58	$c^1$
$d^2$	22.5	- 85	-17 7	306 15	109 8	$c^2$
$d^3$	24.4	-126	-19 55	307 32	110 25	$c^3?c^4$
$d^{\text{n}}$	24.1	- 55	-16 8	308 35	111 28	$c$
$d^{\text{s}}$	25.1	- 64				
$d^4$	27.5	- 60	-16 47	311 15	114 8	
$e$	34.9	+ 67	-11 4	320 8	123 1	$d_2$
$e^1$	37.5	+ 80	-10 50	322 59	125 52	$d^3$
$e^2$	38.0	+ 76	-11 10	323 29	126 22	$d^4$
$f$	35.8	- 21	-16 16	319 53	122 46	$e$
February 15 1 <sup>h</sup> 55 <sup>m</sup>						
$a$	- 6.6	+137	+ 2 29	284 26	101 17	
$b^{\text{n}}$	2.2	-102	-12 44	283 53	100 44	$a$
$b^{\text{s}}$	1.2	-123				
$b^1$	+ 4.9	- 67	-10 54	289 38	106 29	$b^2$
$c^1$	7.5	-137	-16 27	290 48	107 39	$b^1$
$c^2$	8.9	-141	-17 7	292 20	109 11	$b^3$
$c^{\text{n}}$	10.7	-113	-16 13	294 13	111 4	$b$
$c^{\text{s}}$	11.6	-122				
$c^3$	10.7	-178	-19 41	293 13	110 4	
February 16 0 <sup>h</sup> 42 <sup>m</sup>						
$a^{\text{n}}$	-15.5	-178	-13 15	270 7	100 17	$a$
$a^{\text{s}}$	14.4	-201				
$b^1$	7.0	-210	-16 43	276 24	106 34	
$b^2$	6.6	-113	-11 25	278 47	108 57	
$b^3$	4.7	-206	-17 10	278 29	108 39	$b^1$
$b^4$	2.5	-249	-20 11	279 23	109 33	$b^2$
$b^5$	2.1	-160	-15 18	281 36	111 46	$b^3$
$b^{\text{n}}$	2.2	-182				
$b^{\text{s}}$	1.5	-194	-16 56	281 14	111 24	$b$
$b^6$	+ 2.9	-180	-17 48	285 26	115 36	$b^4$
$c_1$	4.9	- 58	-11 28	289 23	119 33	$c$
$c_2$	6.0	- 46	-11 6	290 31	120 41	$c^1$
$c^1$	7.5	0	- 8 54	292 35	122 45	$c^2$
$c^2$	8.7	- 9	- 8 42	293 42	123 52	$c^4$
$c^3$	9.5	- 37	-11 29	293 37	123 48	$d^2$
$c^4$	10.5	- 37	-11 26	294 51	125 1	$d_1, d_2$
$c^{\text{n}}$	11.7	- 23				
$c^5$	12.7	- 28	-11 47	296 29	126 39	$d^3$
February 17 2 <sup>h</sup> 24 <sup>m</sup>						
$a^{\text{n}}$	-29.0	-253	-12 53	255 20	100 32	$a$
$a^{\text{s}}$	27.7	-269				
$b^1$	18.5	-279	-17 2	263 39	108 51	
$b^2$	17.1	-306	-18 59	264 7	109 19	
$b^3$	16.0	-236	-15 27	266 57	112 9	
$b^{\text{s}}$	16.4	-263				
$b^{\text{n}}$	15.5	-249	-16 34	266 29	111 41	$b$
$b^4$	11.5	-238	-16 56	270 49	116 1	
$c^{\text{n}}$	11.9	-112	-10 21	273 31	118 43	$c$
$c^{\text{s}}$	11.0	-126				
$c^1$	10.1	-110	-10 15	274 50	120 2	$c^1$
$c^2$	9.1	- 90	- 9 26	276 5	121 17	
$c^3$	9.1	-108	-10 26	275 42	120 54	$c^2$
$c^4$	7.7	- 80	- 9 17	277 26	122 38	
$d^1$	6.9	-101	-10 40	277 41	122 53	
$d^2$	5.8	-101	-11 0	278 35	123 47	
$d_1$	4.5	- 94	-10 58	279 48	125 0	
$d_2$	3.8	- 83	-10 33	280 36	125 48	$d$
$d^3$	2.2	-101	-12 0	281 34	126 46	$d^1$
$e$	+62.3	+178	- 9 7	359 0	204 12	$f$

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date	Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1863 February 18 2 <sup>h</sup> 15 <sup>m</sup>							February 23 0 <sup>h</sup> 51 <sup>m</sup>						
$a^n$	-39 <sup>s</sup> .5	-321''	-12° 47'	241° 30'	100° 39'	$a$	$a^1$	-48 <sup>s</sup> .5	-285''	-5° 30'	226° 46'	155° 16'	
$a^s$	38.5	-340					$a$	46.9	-284	-6 8	228 50	157 20	
$b^n$		-319					$b^1$	4.5	-41	-8 1	274 45	203 15	$a^3$
$b^s$	27.6	-333	-16 33	252 57	112 6	$c$	$b^n$	+0.5	-10	-8 23	279 41	208 11	$a$
$c$	25.0	-199	-10 30	259 1	118 10	$b$	$b^s$	1.4	-25				
$c^1$	23.7	-185	-10 10	260 29	119 38		$c^n$	-2.6	+381	+14 41	285 40	214 10	$b$
$c^2$	22.7	-178	-10 5	261 32	120 41		$c^s$	1.1	+373				
$d$	17.2	-153	-10 28	266 55	126 4	$b^1?$	$c^1$	+0.1	+421	+16 45	288 17	216 47	
$d^1$	16.6	-177	-11 57	266 51	126 0		$c^2$	0.1	+457	+18 57	289 11	217 41	
$e$	+50.9	+567	+15 32	355 25	214 34	$e$	$c^3$	1.6	+440	+17 30	290 6	218 36	
$e^1$	52.8	+563	+15 25	1 3	220 12	$e^3$	$c^4$	2.6	+434	+16 46	290 46	219 16	
$f$	55.8	+176	-9 17	344 2	203 11	$f^1$	$d^1$	1.7	+195	+3 9	284 38	213 8	
$g$	56.9	+444	+7 10	359 6	218 15	$g$	$d^n$	4.7	+284	+6 45	289 15	217 45	$c$
$g^1$	57.9	+446	+7 28	3 7	222 16	$g^2?g^4$	$d^s$	5.7	+270				
$h$	63.6	+98	-14 9	359 42	218 51		$d^2$	6.9	+297	+7 25	291 6	219 36	
February 21 <sup>h</sup> 12 <sup>m</sup>							$d^3$	9.6	+254	+4 11	292 23	220 53	
$a^n$	-55.0	-490	-13 2	202 45	103 59		$d^4$	9.9	+299	+6 40	293 38	222 8	$c^2$
$a^s$	55.0	-503					$d^5$	10.7	+339	+8 45	295 15	223 45	$c^4$
$a^1$		-465	-11 44	206 48	108 2		$d^6$	13.9	+295	+5 20	296 52	225 22	
$b^n$		-402					$d^7$	14.7	+322	+6 40	298 14	226 44	
$b^s$	52.2	-411	-10 28	217 23	118 37		$d^8$	16.0	+329	+6 43	299 31	228 1	$c^6$
$b^1$	50.5	-368	-9 22	222 21	123 35		$e$	33.3	-51	-18 48	308 10	236 40	
$c$	50.5	-510	-16 18	212 31	113 45		$f$	51.0	+208	-8 8	333 1	261 31	
$d^1$	3.1	-71	-10 7	277 16	178 30		February 25 0 <sup>h</sup> 44 <sup>m</sup>						
$d$	0.2	-55	-10 5	279 59	181 13		$a^1$	-32.9	-275	-10 51	241 31	198 1	$c$
$e^n$	+23.2	+506	+15 6	313 4	214 18	$c$	$a^2$	31.1	-193	-7 10	246 21	202 51	
$e^s$	24.3	+492					$a^3$	30.5	-211	-8 20	246 22	202 52	
$e^1$	26.5	+519	+15 40	316 28	217 42		$a$	26.0	-195	-9 7	250 52	207 22	
$e^2$	27.8	+548	+17 11	318 54	220 8		$b^n$	29.1	+220				$a$
$e^3$	28.7	+533	+16 2	319 10	220 24		$b^s$	27.8	+214	+14 28	257 45	214 15	
$f^1$	23.8	+90	-8 33	303 6	204 20	$b^1$	$c^n$		+102	+6 23	260 22	216 52	$b$
$f^n$	27.2	+123					$c^1$	19.6	+108	+5 5	263 26	219 56	
$f^s$	28.1	+111	-7 59	307 8	208 22	$b$	$c^2$	19.0	+135	+6 21	264 32	221 2	
$g^1$	29.1	+354	+5 9	313 45	214 59	$d^1$	$c^3$	17.9	+161	+7 27	265 57	222 27	
$g^n$	30.9	+400	+7 0	317 0	218 14	$d$	$c^4$	17.9	+186	+8 52	266 26	222 56	
$g^s$	31.7	+388					$c^5$	15.5	+163	+6 46	268 0	224 30	
$g^2$	32.4	+404	+7 15	318 49	220 3	$d^2$	$c^6$	10.9	+184	+6 24	272 14	228 44	
$g^3$	34.9	+438	+8 50	322 5	223 19	$d^5$	$c^7$	8.4	+230	+8 12	275 14	231 44	
$g^4$	34.9	+406	+6 55	321 0	222 14	$d^4$	$c^8$	7.6	+222	+7 28	275 46	232 16	
$g^5$	35.5	+368	+4 32	320 31	221 45	$d^3$	February 28 0 <sup>h</sup> 34 <sup>m</sup>						
$g^6$	37.3	+429	+7 47	324 25	225 39		$a$	-58.0	-21	+14 1	215 47	214 17	
$g^7$	38.6	+404	+6 2	325 0	226 14	$d^6?$	$b$	55.1	-120	+7 16	217 52	216 22	
$g^8$	39.1	+436	+7 51	326 41	227 55		$b^1$	55.1	-143	+6 0	217 8	215 38	
$g^9$	42.7	+422	+6 20	330 23	231 37		$b^2$	53.6	-115	+6 42	220 37	219 7	
$h$	58.4	-9	-21 12	343 48	245 2								



Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date	Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1863 February 28—Continued													
$c$	-54.3	-419"	- 8° 1'	204° 35'	203° 5'	$a$	$c_1$	+10.5	- 71"	-15° 12'	277° 45'	332° 23'	$b$
$d$	13.6	+246	+10 53	268 25	266 55		$c_2$	11.9	- 85	-14 47	278 38	333 16	
$d^1$	11.8	+253	+10 39	270 4	268 34		$c^2$	13.8	- 29	-13 21	281 3	335 41	$b^4?$
$d^2$	11.4	+290	+12 39	271 11	269 41	$a^2$	$c^3$	15.3	- 85	-16 55	281 11	335 49	
$d^3$	10.2	+285	+11 57	272 5	270 35		$c^4$	18.9	+ 16	-12 28	286 26	341 4	
$d^4$	9.5	+297	+12 26	272 50	271 20	$a^4$	$d_1$	19.4	+310	+ 3 42	293 34	348 12	$c$
$e_1$	+55.3	+115	-15 41	333 6	331 36	$c_1$	$d_2$	20.6	+315	+ 3 37	294 45	349 23	$c^2$
$e_2$	55.9	+117	-15 21	334 22	332 52	$c_2$	$d^1$	22.3	+304	+ 2 31	295 56	350 34	
$e^1$	55.9	+163	-12 41	335 17	333 47	$c^1$	$e^1$	39.1	+175	- 9 19	309 7	3 45	$d^1$
$e^2$	56.9	+136	-14 22	336 27	334 57	$c^2$	$e_1$	39.9	+166	-10 1	309 52	4 30	$d_1$
$e^3$	57.7	+156	-13 17	338 32	337 2		$e_2$	40.6	+165	-10 15	310 37	5 15	$d_2$
$f$	56.7	+437	+ 4 0	350 40	349 10	$d$	$e^2$	41.6	+179	- 9 43	312 4	6 42	$d_1^1?$
March 2 3 <sup>h</sup> 55 <sup>m</sup>							$e^3$	42.2	+200	- 8 39	313 10	7 48	
$a$	-43.2	+ 62	+11 16	235 34	264 6	$a^1$	$e_1^1$	43.0	+175	-10 17	313 36	8 14	
$a^1$	42.2	+ 39					$e_2^1$	43.6	+166	-10 55	314 3	8 41	$d_2^1$
$a^2$	40.0	+ 99	+12 50	239 21	267 53		$e^5$	45.2	+170	-11 4	316 8	10 46	$d^4$
$a^3$	38.4	+113	+12 57	241 18	269 50	$b^1$	March 5 1 <sup>h</sup> 7 <sup>m</sup>						
$a^4$	38.4	+ 76	+10 53	240 35	269 7		$a$	-62.4	-131	+11 48	195 43	264 43	
$a^5$	36.9	+120	+12 43	242 57	271 29	$b^2$	$a^1$	60.8	- 97	+12 55	202 3	271 3	
$b$	8.1	-168	-13 36	261 28	290 0		$a^2$	60.2	- 93	+12 44	203 39	272 39	
$b^1$	7.1	-159	-13 28	262 31	291 3		$b^1$	4.6	-127	-12 31	262 23	331 23	
$c_1$	+34.0	+ 35	-16 11	303 35	332 7	$c_1$	$b$	3.0	-170	-15 2	263 38	332 38	$b_1, b_2$
$c_2$	35.5	+ 21					$b^2$	1.4	-145	-16 49	261 20	330 20	
$c^1$	35.5	+ 39	-15 47	304 41	333 13	$c_2$	$b^3$	3.6	-200	-17 29	264 16	333 16	
$c^2$	34.9	+ 83	-13 7	304 42	333 14		$b^4$	0.4	-191	-17 49	267 6	336 6	
$c^3$	38.1	+ 76	-14 21	307 54	336 26	$c^2$	$c^1$	+ 3.7	+267	+ 6 9	278 19	347 19	
$c^4$	41.8	+106	-13 33	312 33	341 5	$c^4$	$c$	5.2	+237	+ 3 52	279 7	348 7	$a$
$d$	44.0	+115	-13 35	315 22	343 54		$c^2$	5.9	+237	+ 3 31	279 56	348 56	$a^1$
$d^1$	41.2	+403	+ 3 8	320 0	348 32	$d_1, d_2$	$d^1$	25.4	+106	- 9 31	293 6	2 6	$d^1$
$d^2$	41.9	+392					$d_1$	27.9	+108	-10 9	295 28	4 28	$d$
$e$	56.4	+226	- 9 33	336 0	4 32		$d_2$	28.6	+106	-10 27	296 3	5 3	
$e^1$	57.1	+207	-10 44	336 46	5 18	$e_2$	$d_1^1$	30.8	+127	- 9 54	298 35	7 35	
$e^2$	58.2	+230	- 9 29	339 50	8 22	$e^3$	$d_2^1$	32.2	+109	-11 18	299 36	8 36	$d^3$
$e^3$	60.6	+196	-11 37	344 26	12 58	$e^5$	$d^2$	33.3	+126	-10 40	301 5	10 5	
March 4 0 <sup>h</sup> 33 <sup>m</sup>							$d^3$	34.0	+131	-10 35	301 54	10 54	
$a$	-58.2	- 64	+12 6	209 24	264 2	$a$	$d^4$	34.0	+115	-11 29	301 34	10 34	$d^5$
$a^1$	58.2	- 92	+11 5	208 52	263 30		March 9 0 <sup>h</sup> 35 <sup>m</sup>						
$a^2$	57.3	- 76	+11 41	211 13	265 51		$a$	-44.7	-115	+ 4 21	222 28	347 18	$a$
$b^1$	55.9	- 51	+12 16	214 17	268 55		$a^1$	44.3	-122	+ 3 49	222 42	347 32	
$b$	55.1	- 30	+12 36	215 49	270 27	$a^1$	$b_1$	44.0	-497	-15 10	206 27	331 17	$b^1$
$b^2$	54.1	- 23	+12 52	217 46	272 24	$a^2$	$b_2$	43.2	-482	-14 52	208 32	333 22	$b^2$
$c^1$	+ 9.3	-126	-17 12	275 3	329 41	$b^2$	$c$	43.1	+ 16	+10 37	227 34	352 24	
							$d^1$	25.1	-216	- 9 14	238 34	3 24	$c^3$

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date	Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1863 March 9—Continued													
$d^n$	-24.50	-228''	-10° 45'	239° 20'	4° 10'	$c$	$a^n$	-43.53	-396''	-10° 28'	210° 55'	4° 53'	$a$
$d^s$	23.2	-239					$a^s$	43.0	-406				
$d^2$	22.6	-209	-9 52	240 55	5 45		$a^3$	41.4	-388	-10 0	212 0	5 58	$a^3$
$d^3$	19.0	-225	-12 8	243 34	8 24		$a^4$	39.6	-403	-12 21	215 12	9 10	$a^4$
$d^4$	18.0	-225	-12 32	244 25	9 15	$c^4$	$b^1$	22.4	+350	+20 52	252 44	46 42	
$d^5$	17.1	-198	-11 28	245 59	10 49		$b$	20.9	+360	+20 50	254 18	48 16	
$d^6$	12.4	-339	-20 51	245 35	10 25		$c$	7.6	+353	+15 2	265 34	59 32	
$e^1$	+17.7	+477	+13 27	292 26	57 16	$d^1$	$c^1$	7.2	+359	+15 15	266 0	59 58	
$e$	20.1	+524	+15 32	296 17	61 7	$d$	$d^n$	+7.9	+18	-9 20	269 50	63 48	$c$
$e^2$	21.4	+473	+12 4	295 35	60 25		$d^s$	+6					
$f$	34.7	+161	-9 20	299 22	64 12		$d^1$	8.8	+25	-8 57	270 53	64 51	
$f^1$	38.3	+221	-7 13	304 34	69 24	$e^1$	$d^2$	8.9	-16	-11 12	270 0	63 58	
$f^2$	43.0	+233	-7 46	310 12	75 2	$f^2$	$e^1$	17.4	+126	-6 21	280 28	74 26	$e$
$f^3$	44.4	+280	-5 26	313 13	78 3		$e^2$	20.1	+106	-8 19	282 21	76 19	$e^1$
$f^4$	45.6	+257	-7 2	314 3	78 53	$f_2$	$e^3$	21.3	+143	-6 24	284 25	78 23	$e^2$
$f^5$	46.9	+237	-8 28	315 11	80 1		$e$	23.1	+161	-6 14	286 14	80 12	$e^3$
$g$	55.2	+257	-8 57	328 37	93 27	$g^1$	$e^4$	23.4	+133	-7 54	285 21	79 19	$f^1$
$g^1$	56.0	+223	-11 3	329 1	93 51	$g^3$	$f^1$	36.1	+182	-9 0	299 16	93 14	$f^1$
$h$	57.7	+177	-13 57	330 59	95 49	$g$	$f^2$	37.2	+181	-9 23	300 25	94 23	
March 10 0 <sup>h</sup> 55 <sup>m</sup>							$f^3$	37.8	+185	-9 20	301 9	95 7	
$a$	-53.0	-198	+4 14	208 4	347 7		$f^4$	37.8	+165	-10 27	300 41	94 39	$f^2$
$b^1$	48.7	-553	-14 57	192 40	331 43		$f$	39.6	+110	-14 1	301 27	95 25	$f$
$b^2$	48.2	-544	-14 53	194 41	333 44		$f^5$	42.9	+179	-11 2	306 42	100 40	$f^3$
$c^1$	36.7	-321	-9 42	222 59	2 2	$a^1$	March 12 0 <sup>h</sup> 27 <sup>m</sup>						
$c^2$	35.3	-305	-9 29	225 2	4 5	$a^2$	$a^1$	-50.2	-477	-10 19	194 54	1 45	
$c^s$	34.8	-330					$a^2$	49.7	-477	-10 38	195 54	2 45	
$c^n$	34.0	-317	-10 49	225 11	4 14	$a$	$a$	48.7	-472	-10 58	198 4	4 55	$a$
$c^3$	32.8	-310	-10 49	227 14	6 17	$a^3 \text{ ? } a^4$	$a^3$	47.7	-462	-11 3	200 24	7 15	$a^1$
$c^4$	29.7	-323	-12 48	229 41	8 44	$a^5$	$a^4$	47.0	-470	-11 46	200 49	7 40	
$d^1$	+3.5	+403	+13 52	276 58	56 1		$b$	14.4	+199	+8 58	255 17	62 8	
$d$	7.1	+432	+14 18	280 52	59 55	$c^1$	$c$	4.4	-85	-10 7	256 28	63 19	$b$
$e$	22.1	+85	-10 2	284 38	63 41	$d$	$d$	+3.1	-39	-10 24	263 43	70 34	$c$
$e^1$	23.1	+108	-9 7	286 6	65 9	$d^1$	$e$	6.2	+53	-6 33	268 28	75 19	$d$
$f^1$	31.5	+191	-7 5	295 52	74 55	$e^1$	$e^1$	7.6	+11	-9 17	268 35	75 26	
$f^2$	33.4	+172	-8 42	297 17	76 20	$e^2$	$e^2$	9.0	+78	-6 9	271 20	78 11	$d^2$
$dot(f)$	33.8	+185	-8 5	298 0	77 3		$e^3$	11.1	+76	-6 59	273 3	79 54	$d^3$
$f_1$	35.4	+218	-6 41	300 23	79 26	$e^3 \text{ ?}$	$f^1$	25.2	+110	-9 47	286 5	92 56	$e^1$
$f_2$	35.9	+212	-7 10	300 48	79 51		$f^2$	26.0	+101	-10 22	286 37	93 28	$e^2$
$f^3$	36.6	+216	-7 8	301 36	80 39		$f$	29.1	+51	-14 16	288 28	95 19	$e$
$g^1$	46.8	+225	-9 16	313 44	92 47	$f^1$	$f^3$	31.5	+115	-11 28	292 10	99 1	
$g^2$	48.1	+218	-9 58	315 17	94 20	$f^2$	March 13 0 <sup>h</sup> 46 <sup>m</sup>						
$g^3$	48.6	+212	-10 25	315 45	94 48	$f^4$	$a$	-52.1	-521	-10 50	185 1	6 5	
$g$	50.0	+150	-14 16	316 20	95 23	$f$	$a^1$	51.3	-523	-11 26	186 48	7 52	
$g^4$	52.7	+214	-11 10	321 54	100 57	$f^5$	$b$	17.8	-190	-10 28	241 31	62 35	
March 11 2 <sup>h</sup> 25 <sup>m</sup>							$c$	10.8	-144	-10 47	248 39	69 43	$b$
$a^1$	-44.7	-403	-9 55	209 7	3 5	$a^1 \text{ ? } a^2$	$d$	8.5	-45	-6 26	253 11	74 15	$c, c_2$
$a^2$	44.4	-388	-9 17	210 13	4 11		$d^1$	6.2	-37	-6 51	255 12	76° 16	

Letter	<i>Δα</i>	<i>Δδ</i>	b	L	L'	Letter on next date
1863 March 13—Continued						
<i>d</i> <sup>2</sup>	− 5 <sup>h</sup> 8	− 9 <sup>m</sup>	− 5° 32'	256° 16'	77° 20'	<i>c</i> <sup>2</sup>
<i>d</i> <sup>3</sup>	4.2	− 21	− 6 46	257 16	78 20	<i>c</i> <sup>3</sup>
<i>d</i> <sup>4</sup>	2.0	− 39	− 8 32	258 33	79 37	
<i>e</i> <sup>1</sup>	+12.2	+ 30	− 9 53	271 53	92 57	
<i>e</i> <sup>2</sup>	13.1	+ 16	−10 47	272 19	93 23	<i>d</i> <sup>2</sup>
<i>e</i>	16.7	− 30	−14 41	274 21	95 25	<i>d</i>
<i>f</i>	48.0	+620	+14 22	336 45	157 49	<i>e</i>
March 14 2 <sup>h</sup> 43 <sup>m</sup>						
<i>a</i>	−29.0	−335	−13 15	225 41	61 55	
<i>a</i> <sup>1</sup>	28.1	−331	−13 26	226 40	62 54	
<i>a</i> <sup>2</sup>	26.7	−312	−13 5	228 42	64 56	<i>a</i>
<i>b</i>	24.4	−238	−10 17	233 16	69 30	
<i>c</i> <sub>1</sub>	22.9	−158	− 6 39	237 2	73 16	} <i>b</i>
<i>c</i> <sub>2</sub>	22.4	−153	− 6 36	237 40	73 54	
<i>c</i> <sup>1</sup>	20.9	−133	− 6 9	239 28	75 42	
<i>c</i> <sup>2</sup>	19.6	−117	− 5 45	241 3	77 17	
<i>c</i> <sup>3</sup>	18.4	−124	− 6 41	241 49	78 3	
<i>c</i> <sup>4</sup>	17.9	−112	− 6 15	242 34	78 48	
<i>c</i> <sup>5</sup>	17.5	−122	− 6 57	242 38	78 52	<i>b</i> <sup>2</sup>
<i>c</i> <sup>6</sup>	16.5	−126	− 7 33	243 21	79 35	<i>b</i> <sup>3</sup>
<i>d</i> <sup>1</sup>	3.9	− 53	− 8 33	255 34	91 48	
<i>d</i> <sup>2</sup>	1.6	− 71	−10 21	256 59	93 13	
<i>d</i>	+2.7	−123	−14 45	259 11	95 25	<i>c</i>
<i>e</i> <sup>1</sup>	39.8	+666	+18 30	322 52	159 6	
<i>e</i> <sup>2</sup>	41.2	+646	+16 49	323 21	159 35	<i>d</i> <sup>1</sup>
<i>e</i> <sup>n</sup>	42.3	+624				<i>d</i>
<i>e</i> <sub>s</sub>	43.0	+616	+14 47	323 25	159 39	
March 15 0 <sup>h</sup> 23 <sup>m</sup>						
<i>a</i>	−35.3	−392	−13 13	216 13	65 7	
<i>b</i>	33.0	−254	− 7 14	223 59	72 53	<i>a</i>
<i>b</i> <sup>1</sup>	31.3	−188	− 4 34	227 47	76 41	
<i>b</i> <sup>2</sup>	28.3	−209	− 6 58	229 53	78 47	<i>b</i>
<i>b</i> <sup>3</sup>	27.5	−208	− 7 14	230 35	79 29	
<i>c</i>	8.5	−211	−15 7	246 37	95 31	<i>c</i>
<i>d</i> <sup>1</sup>	+33.0	+628	+17 31	309 23	158 17	<i>e</i> <sup>1</sup>
<i>d</i> <sup>n</sup>	35.7	+600				<i>e</i>
<i>d</i> <sub>s</sub>	36.6	+590	+14 34	311 8	160 2	
<i>e</i>	61.0	+273	− 9 11	339 55	188 49	<i>f</i>
<i>e</i> <sup>1</sup>	61.0	+238	−11 26	337 13	186 7	<i>f</i> <sup>1</sup>
March 16 0 <sup>h</sup> 27 <sup>m</sup>						
<i>a</i>	−42.8	−345	− 7 14	209 9	72 8	
<i>b</i>	38.6	−297	− 6 47	215 47	78 46	
<i>c</i>	20.4	−302	−15 1	232 37	95 36	<i>a</i>
<i>d</i>	+15.0	+437	+11 37	282 10	145 9	<i>b-b</i> <sup>3</sup>
<i>e</i> <sup>1</sup>	23.5	+579	+17 15	295 30	158 29	
Letter	<i>Δα</i>	<i>Δδ</i>	b	L	L'	Letter on next date
<i>e</i> <sup>2</sup>	+24 <sup>h</sup> 8	+555 <sup>m</sup>	+15° 22'	295° 37'	158° 36'	<i>c</i> <sup>1</sup>
<i>e</i> <sup>n</sup>	25.8	+559				
<i>e</i> <sub>s</sub>	26.9	+544	+14 38	297 2	160 1	<i>c</i>
<i>e</i> <sup>3</sup>	26.8	+599	+17 26	299 50	162 49	<i>c</i> <sup>4</sup>
<i>f</i>	55.6	+272	− 9 10	323 23	186 22	<i>e</i>
<i>f</i> <sup>1</sup>	56.1	+243	−10 56	323 16	186 15	<i>e</i> <sup>1</sup>
<i>f</i> <sup>2</sup>	58.6	+263	−10 2	330 0	192 59	<i>e</i> <sup>2</sup>
March 18 0 <sup>h</sup> 47 <sup>m</sup>						
<i>a</i>	−39.5	−472	−14 49	204 24	95 39	<i>a</i>
<i>b</i>	13.9	+265	+12 45	251 32	142 47	<i>b</i>
<i>b</i> <sup>1</sup>	13.3	+268	+12 40	252 6	143 21	
<i>b</i> <sup>2</sup>	8.4	+247	+ 9 31	255 38	146 53	
<i>b</i> <sup>3</sup>	7.6	+252	+ 9 29	256 25	147 40	<i>b</i> <sup>4</sup>
<i>c</i> <sup>1</sup>	0.6	+421	+16 24	266 45	158 0	
<i>c</i> <sup>n</sup>	+1.0	+414				<i>c</i>
<i>c</i> <sub>s</sub>	2.7	+403	+14 45	268 18	159 33	
<i>c</i> <sup>2</sup>	1.6	+479	+19 2	270 18	161 33	
<i>c</i> <sup>3</sup>	2.7	+479	+18 36	271 13	162 28	<i>c</i> <sup>1</sup>
<i>c</i> <sup>4</sup>	4.1	+470	+17 31	272 6	163 21	
<i>d</i>	20.7	+403	+ 7 42	284 7	175 22	
<i>d</i> <sup>1</sup>	23.4	+407	+ 7 0	286 43	177 58	
<i>e</i>	38.5	+201	− 9 12	295 26	186 41	<i>d</i> <sup>2</sup>
<i>e</i> <sup>1</sup>	38.5	+170	−10 55	294 40	185 55	
<i>e</i> <sup>2</sup>	43.3	+201	−10 38	300 56	192 11	<i>d</i> <sup>3</sup> ?
<i>e</i> <sup>3</sup>	45.6	+222	−10 1	304 19	195 34	<i>d</i>
<i>e</i> <sup>4</sup>	48.7	+236	−10 1	308 51	200 6	
<i>f</i>	43.1	+599	+12 57	318 45	210 0	<i>e</i>
<i>g</i> <sup>1</sup>	46.7	+495	+ 5 33	317 8	208 23	
<i>g</i>	47.4					
<i>g</i> <sup>2</sup>	49.1	+463	+ 3 17	317 43	208 58	<i>f</i>
<i>g</i> <sup>3</sup>	49.1	+435	+ 1 25	317 33	208 48	
<i>g</i> <sup>4</sup>	51.6	+460	+ 2 31	323 50	215 5	<i>f</i> <sup>4</sup>
	54.1	+482	+ 3 46	332 19	223 34	<i>f</i> <sup>6</sup>
March 19 0 <sup>h</sup> 42 <sup>m</sup>						
<i>a</i>	−45.5	−548	−15 8	189 40	94 54	
<i>b</i> <sup>1</sup>	27.2	+135	+11 8	236 4	141 18	<i>a</i>
<i>b</i>	27.0	+151	+11 56	236 42	141 56	<i>a</i> <sup>1</sup>
<i>b</i> <sup>2</sup>	25.9	+133	+10 29	237 11	142 25	
<i>b</i> <sup>3</sup>	24.3	+166	+11 37	239 22	144 36	<i>a</i> <sup>2</sup>
<i>b</i> <sup>4</sup>	22.4	+151	+ 9 58	240 39	145 53	<i>a</i> <sup>3</sup>
<i>c</i> <sup>n</sup>	11.7	+315				<i>b</i>
<i>c</i> <sub>s</sub>	10.4	+303	+14 6	254 4	159 18	
<i>c</i> <sup>1</sup>	10.8	+383	+18 18	256 11	161 25	
<i>d</i> <sup>1</sup>	+22.7	+124	− 8 29	277 10	182 24	
<i>d</i> <sup>2</sup>	26.6	+126	− 9 41	280 46	186 0	
<i>d</i> <sup>3</sup>	31.4	+128	−11 9	285 24	190 38	
<i>d</i>	34.8	+149	−11 3	289 15	194 29	
<i>e</i>	35.4	+565	+12 30	304 45	209 59	<i>d</i>



Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date	Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1863 March 19—Continued													
$f^1$	+38 <sup>s</sup> .1	+439''	+ 4° 15'	301° 48'	207° 2'	$e^1$	$b^{12}$	-10 <sup>s</sup> .7	+259''	+11° 43'	242° 27'	301° 47'	$d^3$
$f^2$	39.1	+459	+ 5 8	303 50	209 4		$c$	3.5	+323	+12 18	250 4	309 24	
$f^3$	40.1	+428	+ 2 48	303 30	208 44	$e_2$	$c^1$	2.4	+305	+10 53	250 24	309 44	$b^6$
$f^4$	41.9	+419	+ 6 32	309 3	214 17	$e^2?$	$d$	+32.9	+370	+ 1 38	282 55	342 15	
$f^5$	44.8	+495	+ 1 33	309 25	214 39	$e^4$	$d^1$	38.1	+369	- 0 4	288 23	347 43	$b^7$
$f^6$	45.2	+423	+ 4 40	312 42	217 56	$e^5$	$d^2$	41.1	+389	+ 0 11	292 33	351 53	
$g$	49.4	+477	+ 3 29	319 22	224 36	$e^6$	$d^3$	41.8	+370	- 1 13	292 40	352 0	$e$
	60.1	+204	-14 3	328 48	234 2		$e$	51.2	+233	-11 18	300 40	0 0	
March 20 0 <sup>h</sup> 34 <sup>m</sup>							April 3 1 <sup>h</sup> 52 <sup>m</sup>						
$a$	-39.3	+ 43	+11 39	221 25	140 36	$b$	$a$	-60.5	-199	+11 31	168 35	285 0	$a$
$a^1$	38.6	+ 59	+12 12	222 31	141 42		$a^1$	59.0	-177	+11 37	173 31	289 56	
$a^2$	35.9	+ 75	+11 50	225 36	144 47	$b^1$	$a^2$	56.6	-131	+12 28	180 24	296 49	$a^1$
$a^3$	33.5	+ 61	+ 9 57	227 37	146 48		$a^3$	56.1	-108	+13 25	181 57	298 22	
$b^s$	24.3	+214	+14 32	240 16	159 27	$b^2$	$b$	22.3	- 25	+ 1 31	221 31	337 56	$b^1$
$b^n$	23.1	+230	+ 3 46	250 5	169 16		$b^1$	20.4	- 12	+ 1 23	223 28	339 53	
$c$	9.3	+134	+12 57	291 29	210 40	$b^4$	$b^2$	17.4	+ 23	+ 1 57	226 55	343 20	$b^2$
$d$	+25.8	+524	+ 3 13	288 22	207 33		$b^3$	16.1	+ 32	+ 1 54	228 11	344 36	
$e_1$	28.5	+371	+ 3 10	289 43	208 54	$c$	$b^4$	15.4	+ 30	+ 1 29	228 44	345 9	$b^4$
$e_2$	29.7	+382	+ 6 23	290 18	209 29		$b^5$	10.6	+ 81	+ 2 14	233 54	350 19	
$e^1$	28.5	+427	+ 7 19	295 9	214 20	$d$	$b^6$	9.9	+ 55	+ 0 34	233 46	350 11	$c$
$e^2$	32.0	+462	+ 2 29	293 27	212 38		$b^7$	8.7	+ 53	- 0 1	234 40	351 5	
$e^3$	33.2	+384	+ 1 40	295 21	214 32	$e^1$	$c$	7.5	-287	-18 29	225 49	342 14	$d$
$e^4$	35.2	+380	+ 4 34	298 20	217 31		$d$	6.2	-200	-14 24	229 38	346 3	
$e^5$	36.0	+435	+ 3 58	306 5	225 16		$e^1$	+ 1.2	- 44	- 9 1	240 5	356 30	
$e^6$	41.9	+453					$e$	5.4	- 58	-11 30	242 58	359 23	
March 30 0 <sup>h</sup> 13 <sup>m</sup>							April 4 2 <sup>h</sup> 26 <sup>m</sup>						
$a^1$	-45.7	-350	- 4 35	191 21	250 41	$a$	$a$	-62.0	-232	+11 19	158 52	289 39	$a$
$a$	45.1	-418	- 8 10	188 28	247 48		$a^1_1$	60.8	-186	+12 45	167 21	298 8	
$a^2$	42.7	-414	- 9 13	191 48	251 8	$b^s$	$a^2_2$	60.8	-200	+11 45	166 27	297 14	$b^1$
$a^3$	41.8	-366	- 7 21	195 21	254 41		$a^3_3$	60.8	-216	+10 59	165 27	296 14	
$a^4$	40.4	-412	-10 16	194 37	253 57	$b^n$	$b^s$	34.6	-152	+ 0 42	206 6	336 53	$b^2$
$a^5$	39.5	-387	- 9 30	196 53	256 13		$b^n$		-140				
$b^1$	31.9	+ 63	+10 10	219 22	278 42	$b^3$	$b^1$	29.8	- 94	+ 1 14	212 8	342 55	$b^3$
$b^2$	29.8	+ 79	+10 4	221 42	281 2		$b^2$	29.4	- 91	+ 1 13	212 32	343 19	
$b^3$	26.4	+158	+12 52	226 40	286 0	$b^4$	$b^3$	23.8	- 78	- 0 33	217 46	348 33	$b^4$
$b^s$	25.9	+118	+10 35	226 47	286 7		$b^4$	23.3	- 72	- 0 27	218 22	349 9	
$b^n$	24.8	+132	+12 13	228 45	288 5	$b^5$	$b^5$	23.0	- 60	+ 0 3	218 57	349 44	$b^5$
$b^4$	24.2	+164	+12 9	230 12	289 32		$b^6$	20.5	- 62	- 1 7	220 59	351 46	
$b^5$	22.8	+174	+10 43	229 59	289 19	$c$	$c$	19.9	-276	-12 30	214 49	345 36	$c$
$b^6$	22.4	+151	+10 38	233 10	292 30		$c^1$	18.4	-269	-12 47	216 23	347 10	
$b^7$	19.3	+174	+13 45	235 0	294 20	$d$	$d$	7.9	-177	-12 25	227 56	358 43	$d$
$b^8$	17.3	+252	+12 18	237 14	296 34		$d^1$	7.6	-171	-12 12	228 19	359 6	
$b^9$	16.1	+229	+13 24	238 28	297 48	$a^1$	April 9 22 <sup>h</sup> 46 <sup>m</sup>						
$b^{10}$	15.4	+254					$a$	-41.7	-539	-15 28	175 36	14 25	$a^1$
$b^{11}$							$a^1$	41.1	-550	-16 17	175 30	14 19	
							$b$	0.4	- 37	- 7 42	233 5	71 54	$a^2$
							$c$	+14.2	-106	-18 36	242 31	81 20	

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1863 April 9—Continued						
$c^1$	+16 <sup>s</sup> .1	— 44"	—14° 28'	246° 23'	85° 12'	
$d$	34.5	— 48	—21 31	263 33	102 22	
April 11 2 <sup>h</sup> 4 <sup>m</sup>						
$a$	—32.9	—291	— 7 12	195 58	64 47	$a$
$a^1$	30.7	—307	— 9 0	197 26	66 15	
$a^2$	30.1	—271	— 7 28	199 22	68 11	$a^1$
$a^3$	29.4	—289	— 8 40	199 18	68 7	$a^2?$
$b$	5.4	— 92	— 8 31	225 33	94 22	
$c$	+14.4	+447	+13 13	256 50	125 39	
$d$	30.7	+710	+23 31	287 20	156 9	
$e$	41.5	+461	+ 4 44	284 21	153 10	$c^1$
April 13 0 <sup>h</sup> 8 <sup>m</sup>						
$a$	—49.2	—438	— 6 43	167 57	63 42	$a$
$a^1$	46.9	—418	— 6 57	172 40	68 25	$a^1$
$a^2$	45.3	—444	— 9 3	173 22	69 7	$a^2?$
$b$	+10.4	+440	+14 32	251 15	147 0	$b^1$
$b^1$	11.0	+455	+15 10	252 20	148 5	
$b^2$		+467				
$b^2$	13.0	+462	+14 58	254 22	150 7	$b^2$
$c$	16.3	+328	+ 5 59	252 33	148 18	
$c^1$	20.8	+343	+ 5 12	256 49	152 34	$c$
$d^1$	44.1	+560	+10 5	292 0	187 45	
$d^2$	45.2	+542	+ 8 42	292 25	188 10	$e^1$
$d^3$	45.4	+633	+14 31	301 53	197 38	$e^2$
$d^4$	46.5	+620	+13 26	302 48	198 33	$e^3$
$d$	46.7	+575				
$d$	47.6	+557	+ 9 44	298 0	193 45	$e$
$d^5$	48.3	+617	+13 1	307 44	203 29	$e^5$
April 14 0 <sup>h</sup> 23 <sup>m</sup>						
$a$	—52.9	—490	— 7 3	155 4	65 0	
$a^1$	52.6	—472	— 6 27	157 48	67 44	
$a^2$	51.4	—477	— 7 23	159 58	69 54	
$b$	4.6	+341	+14 52	234 59	144 54	
$b^1$	3.2	+348	+14 43	236 16	146 12	
$b^2$	+ 0.6	+389	+15 33	240 32	150 28	$a$
$c$	7.3	+268	+ 6 8	242 23	152 19	
$d$	27.0	+658	+21 40	275 56	185 52	$b?$
$d^1$	28.7	+681	+22 34	279 28	189 24	$b^1$
$e^1$	36.4	+507	+ 9 18	277 29	187 25	$c$
$e^2$	39.4	+616	+15 0	288 14	198 10	$f^1$
$e$	39.5	+548				
$e$	40.9	+528	+ 9 59	283 51	193 47	$d$
$e^3$	40.8	+598	+13 27	288 50	198 46	$f^2$
$e^4$	42.4	+595	+12 51	291 4	201 0	
$e^5$	43.6	+605	+13 10	294 0	203 56	$f$
April 19 22 <sup>h</sup> 52 <sup>m</sup>						
$a$	—54 <sup>s</sup> .9	— 23"	+17° 22'	171° 17'	150° 29'	
$b$	33.2	+246	+22 8	202 43	181 55	$a$
$b^1$	28.3	+294	+22 44	208 28	187 40	
$c$	25.2	+ 92	+ 9 53	206 33	185 45	$b$
$d$	19.5	+152				
$d$	17.5	+133	+ 9 51	213 29	192 41	$c$
$e$	17.0	—175	— 7 42	206 9	185 21	
$e^1$	14.4	—214	—10 49	207 5	186 17	
$f^1$	16.0	+251	+14 53	218 16	197 28	
$f^2$	13.7	+255	+14 10	220 16	199 28	$d, d_2$
$f$	8.8	+276				
$f$	7.8	+262	+12 44	225 3	204 15	$e$
$g^1$	6.0	+367	+17 24	229 40	208 52	$f$
$g$	2.3	+356	+15 6	232 43	211 55	$g$
$g^2$	+ 0.8	+414	+17 26	236 36	215 48	
April 21 0 <sup>h</sup> 46 <sup>m</sup>						
$a$	—53.3	+ 85	+22 32	172 50	181 14	$a$
$a$		+ 76				
$b$	47.9	— 85	+10 15	177 30	185 54	$b^1$
$c^1$	45.9	— 53	+11 6	180 40	189 4	
$c^2$	44.4	— 6	+12 58	183 33	191 57	$b^3$
$c$	43.6	— 62				
$c$	42.1	— 44	+ 9 42	184 6	192 30	$b$
$c^3$	41.7	—140	+ 4 34	182 52	191 16	
$d_1$	39.3	+ 67	+14 41	190 44	199 8	$c^1 c$
$d_2$	38.7	+ 64	+14 14	191 17	199 41	
$e$		+ 74				
$e$	34.7	+ 62	+12 40	195 23	203 47	$d$
$f$	32.7	+177	+17 57	199 42	208 6	$e$
$f^1$	32.1	+184	+18 5	200 25	208 49	$e^1$
$g$	27.8	+168	+15 17	204 5	212 29	$e^3?$
April 22 0 <sup>h</sup> 53 <sup>m</sup>						
$a$	—59.7	+ 18	+22 5	159 54	182 23	$a$
$b^1$	55.7	—153	+10 24	163 23	185 52	$b^1$
$b^2$	53.5	—132	+10 25	167 33	190 2	
$b^3$	53.1	— 93	+12 19	169 19	191 48	
$b$	52.5	—125				
$b$	51.4	—144	+ 9 31	169 46	192 15	$b$
$b^4$	50.2	—107	+10 9	172 56	195 25	
$c^1$	49.4	— 38	+13 31	175 48	198 17	
$c$	48.7	— 24	+13 56	177 2	199 31	$c^1$
$c^2$	48.1	— 17	+14 2	177 57	200 26	
$d$	45.4	— 24	+12 24	181 0	203 29	$c$
$e$	43.9	+ 82	+17 36	185 7	207 36	$d$
$e^1$	43.3	+ 98	+18 13	186 8	208 37	$d^1$

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1863 April 22—Continued						
$e^2$	-42.5	+100"	+17° 59'	187° 1'	209° 30'	$d^2$
$e^3$	39.3	+100	+16 32	190 27	212 56	
$f$	+3.9	-12	-6 57	224 21	246 50	
April 23 2 <sup>h</sup> 25 <sup>m</sup>						
$a$	-63.9	+23	+24 54	146 59	184 24	$a$
$b^1$	61.0	-205	+10 29	149 10	186 35	
$b^2$	58.6	-196	+9 13	155 4	192 29	
$c^1$	57.3	-101	+13 55	161 17	198 42	$b$
$c$	54.4	-106	+12 45	165 50	203 15	
$d$	53.6	+5	+17 52	170 0	207 25	
$d^1$	53.1	+12	+18 0	170 54	208 19	$c^1$
$d^2$	51.6	0	+16 37	172 44	210 9	
$e$	1.9	-132	-9 32	214 2	251 27	
$f$	+51.7	+336	-3 43	280 18	317 43	$D$
$g$	54.4	+433	+1 20	291 5	328 30	
April 24 3 <sup>h</sup> 12 <sup>m</sup>						
$a$	-62.0	-244	+9 5	142 9	194 4	$a$
$b$	60.5	-157	+12 33	151 53	203 48	
$c$	60.2	-58	+17 45	155 47	207 42	
$c^1$	59.8	-51	+17 57	156 44	208 39	$b^2$
$c^2$	58.5	-62	+16 36	159 8	211 3	
$d$	18.5	-249	-10 50	197 45	249 40	
$d^1$	16.3	-245	-11 30	199 42	251 37	$b^3$
$d^2$	16.0	-240	-11 21	200 6	252 1	
$e^1$	+44.9	+290	-4 12	268 0	319 55	
$e$	44.9	+270	-5 19	267 20	318 15	$b^4$
$f$	47.7	+404	+1 27	276 18	328 13	
April 26 0 <sup>h</sup> 6 <sup>m</sup>						
$a$	+29.5	+285	+0 46	249 27	327 37	$a$
$b$	52.7	+297	-5 41	276 46	354 56	
$b^1$	53.7	+308	-5 19	278 58	357 8	
April 28 0 <sup>h</sup> 23 <sup>m</sup>						
$a$	+3.4	+118	+0 56	221 24	327 48	$a$
$b$	14.0	-71	-13 9	225 18	331 42	
$b^1$	16.2	-47	-12 37	227 43	334 7	
$b^2$	17.8	-91	-15 38	228 3	334 27	$b^1$
$b^3$	18.2	-34	-12 36	229 41	336 5	
$b^4$	18.7	-52	-13 47	229 43	336 7	
$b^5$	19.6	-48	-14 34	230 19	336 43	$b^2$
$c$	44.3	+653	+18 20	286 31	32 55	
April 29 2 <sup>h</sup> 28 <sup>m</sup>						
$a$	-11.7	+7"	+0° 31'	205° 38'	327° 17'	$a$
$b$	2.8	-186	-13 25	208 6	329 45	
$b^1$	1.8	-186	-13 25	208 6	329 45	
$b^2$	+0.9	-154	-12 51	211 31	333 10	$b^1?$
$b^3$	1.9	-161	-13 36	212 9	333 48	
$b^4$	1.9	-200	-15 45	211 7	332 46	
$b^5$	2.7	-133	-12 22	213 31	335 10	$b^2$
$c$	5.1	-152	-14 16	214 56	336 35	
$c$	37.8	+622	+18 21	271 3	32 42	
April 30 0 <sup>h</sup> 49 <sup>m</sup>						
$a$	-24.4	-74	+0 56	192 17	327 1	$a$
$b^1$	16.3	-255	-12 23	194 12	328 56	
$b^2$	15.1	-266	-12 23	194 12	328 56	
$b^3$	14.4	-262	-13 24	195 0	329 44	$b$
$b^4$	12.6	-278	-13 24	195 0	329 44	
$b^5$	12.6	-244	-12 40	197 14	331 58	
$c^1$	11.6	-283	-15 10	196 51	331 35	$b^1$
$c^2$	10.4	-175	-9 44	201 0	335 44	
$c^3$	10.4	-212	-11 44	199 58	334 42	
$d$	10.1	-268	-14 56	198 35	333 19	$b^2$
$d^1$	9.7	-235	-13 16	199 51	334 35	
$d^2$	7.0	-230	-14 24	202 26	337 10	
$e$	6.1	-238	-14 24	202 26	337 10	$b^3$
$f$	+30.2	+581	+18 25	258 21	33 5	
$g$	32.9	-179	-5 39	245 49	20 33	
$h$	35.0	+173	-6 23	247 53	22 37	$d$
$i$	35.7	+175	-6 23	247 53	22 37	
$j$	35.7	+209	-4 43	249 28	24 12	
May 1 1 <sup>h</sup> 56 <sup>m</sup>						
$a$	-36.8	-159	+1 28	177 45	327 10	$a$
$b$	28.7	-335	-12 14	179 53	329 18	
$b^1$	27.1	-355	-12 14	179 53	329 18	
$b^2$	25.5	-337	-12 44	182 19	331 44	$b$
$b^3$	23.3	-304	-11 48	185 25	334 50	
$b^4$	21.5	-325	-13 38	186 15	335 40	
$b^5$	21.5	-355	-15 16	185 10	334 35	$b^2?$
$c$	19.3	-322	-14 48	188 29	337 54	
$c^1$	18.3	-332	-14 48	188 29	337 54	
$c^2$	+19.1	+87	-5 48	230 19	19 44	$b^4$
$c^3$	19.8	+74	-6 45	230 36	20 1	
$c^4$	22.4	+99	-6 16	233 27	22 52	
$c^5$	23.2	+138	-4 23	235 6	24 31	$c_1$
$d$	24.0	+107	-6 21	235 2	24 27	
$e$	19.8	+520	+18 28	244 14	33 39	



Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1863 May 1—Continued						
$e^1$	+22 <sup>s</sup> .4	— 23''	—13° 0'	230° 38'	20° 3'	D
$e^2$	26.5	— 9	—13 36	234 33	23 58	
May 2 0 <sup>h</sup> 8 <sup>m</sup>						
$a$	—47.2	—238	+ 1 7	163 10	326 8	$a$
$b^{\text{n}}$	39.1	—409	—11 57	165 45	328 43	$b$
$b^{\text{s}}$	37.6	—425				
$b^1$	37.1	—430	—13 9	166 26	329 24	
$b^2$	34.3	—389	—12 5	171 10	334 8	
$b^3$	31.4	—418	—14 49	172 45	335 43	$b^2$
$b^{\text{n}}$	30.0	—409				$b^4$
$b^{\text{s}}$	29.0	—416	—15 17	174 51	337 49	
$c_1$	+ 4.6	— 10	— 5 58	215 14	18 12	C
$c_2$	5.2	— 2	— 5 46	215 56	18 54	
$c^1$	6.8	+ 18	— 5 12	217 39	20 37	$c^1$
$c^2$	6.8	— 12	— 6 51	216 56	19 54	
$c^3$	8.7	+ 18	— 5 53	219 13	22 11	$c^3?$
$c^4$	10.0	+ 23	— 6 4	220 23	23 21	$c^4?$
$c^5$	10.7	+ 41	— 5 18	221 20	24 18	$c^5$
$d^1$	7.3	—110	—12 25	215 1	17 59	D
$d^2$	8.6	—108	—12 46	216 7	19 5	
$d^3$	9.4	— 90	—12 3	217 12	20 10	
$d$	12.9	— 94	—14 17	219 40	22 38	
$e$	7.8	+443	+18 18	229 58	22 56	
$e^1$	9.2	+448	+18 6	231 20	34 18	
$e^2$	10.5	+473	+19 8	233 16	36 14	
$f^1$	33.8	+423	+ 8 21	252 30	55 28	$e$
$f$	34.3	+461	+10 24	254 36	57 34	$e^2$
May 3 1 <sup>h</sup> 32 <sup>m</sup>						
$a$	—54.9	—298	+ 1 9	148 51	326 6	$a$
$b^{\text{n}}$	47.3	—475	—12 3	151 8	328 23	
$b^{\text{s}}$	45.7	—488				
$b^1$	44.7	—430	—10 7	156 46	334 1	
$b^2$	40.4	—477	—14 23	159 23	336 38	
$b^{\text{n}}$	39.1	—482				$a^1$
$b^{\text{s}}$	38.4	—488	—15 30	160 52	338 7	
$c_1$	9.3	—103	— 6 4	200 58	18 13	B
$c_2$	9.3	—115	— 6 43	200 39	17 54	
$c^1$	7.7	— 78	— 5 17	202 55	20 10	$c^1$
$c^2$	5.9	— 53	— 4 33	204 55	22 10	
$c^3$	5.0	— 87	— 6 50	204 50	22 5	
$c^4$	4.1	— 74	— 6 26	205 55	23 10	
$c^5$	3.6	— 48	— 5 7	206 54	24 9	
$d^1$	7.7	—207	—12 20	199 31	16 46	
$d^2$	6.6	—193	—11 57	200 45	18 0	$c$
$d^3$	1.8	—177	—12 47	205 4	22 19	
$d^4$	1.3	—191	—13 44	205 4	22 19	
$d$	0.4	—175	—13 11	206 13	23 28	$c^2$
May 5 0 <sup>h</sup> 34 <sup>m</sup>						
$a$	—53.2	—546	—12 25	128 42	333 27	
$a^1$	49.6	—573	—15 38	135 35	340 20	
$b$	34.8	—289	— 6 45	171 56	16 41	
$b^1$	33.7	—290	— 7 12	172 53	17 38	
$b^2$	32.3	—257	— 5 57	175 19	20 4	
$b^3$	30.4	—230	— 5 13	177 54	22 39	
$c$	29.8	—350	—11 55	174 23	19 8	
$c^1$	27.3	—349	—12 48	176 42	21 27	
$c^2$	25.5	—335	—12 43	178 49	23 34	
$d$	17.7	—189	— 7 39	190 4	34 49	
$d^1$	15.5	—167	— 7 15	192 59	37 44	$b$
$e$	5.0	+156	+ 6 46	208 48	53 33	$c?$
$e^1$	3.9	+146	+ 5 49	209 26	54 11	
$f$	+ 5.4	—161	—14 15	209 24	54 9	
$g$	35.6	+470	+11 10	253 23	98 8	$d^1?$
$g^1$	37.6	+493	+11 56	256 37	101 22	
$g^2$	38.1	+497	+12 1	257 27	102 12	
$g^3$	41.9	+528	+12 44	263 51	108 36	$d$
$g^4$	43.9	+495	+10 11	264 33	109 18	
$h^{\text{n}}$	58.2	+290	— 6 3	276 36	121 21	$e?$
$h^{\text{s}}$		+267				
$h^1$	60.8	+287	— 6 4	283 37	128 22	$e^3$
May 8 0 <sup>h</sup> 39 <sup>m</sup>						
$a$	—62.2	—264	+ 5 22	129 56	16 50	
$a^1$	60.9	—286	+ 3 36	132 22	19 16	
$b^1$	51.4	—402	— 6 38	144 35	31 29	$b?$
$b$	48.2	—389	— 7 16	150 5	36 59	$b^1$
$b^2$	47.9	—375	— 6 39	151 13	38 7	$b^2$
$c$	45.1	— 94	+ 7 28	164 20	51 14	
$c^1$	42.0	— 41	+ 9 13	168 58	55 52	
$d^1$	3.5	+243	+11 30	209 1	95 55	
$d^2$	+ 1.2	+300	+13 10	214 14	101 8	$c^1$
$d$	8.5	+323	+12 2	220 46	107 40	$c$
$d_3$	9.8	+337	+12 24	222 14	109 8	
$e^1$	26.1	+131	— 4 22	230 34	117 28	$d^1$
$e^2$	26.1	+179	— 1 42	231 43	118 37	$d^2$
$e^{\text{n}}$	29.5	+145	— 5 12	234 13	121 7	$d$
$e^{\text{s}}$	30.6	+131				
$e^3$	36.5	+138	— 7 11	240 25	127 19	$d^5$
$e^4$	39.0	+148	— 7 23	243 10	130 4	$d^6$
$f$	53.6	+152	—11 20	260 54	147 48	$e$
$f^1$	56.5	+154	—11 59	265 31	152 25	$e^1$

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1863 May 9 0 <sup>h</sup> 46 <sup>m</sup>						
a	-57 <sup>s</sup> 8	-218''	+ 5° 36'	142° 9'	43° 9'	a b <sup>1</sup> b <sup>2</sup> c <sup>1</sup> c c <sup>2</sup> d <sup>1</sup> d <sup>2</sup> d <sup>3</sup> d <sup>4</sup> d <sup>n</sup> d <sup>s</sup> d <sup>5</sup> d <sup>6</sup> e e <sup>1</sup> f g
b	55.2	-429	- 6 36	134 44	35 44	
b <sup>1</sup>	54.2	-421	- 6 38	137 30	38 30	
b <sup>2</sup>	54.2	-434	- 7 18	136 27	37 27	
c <sup>1</sup>	13.7	+216	+13 35	199 5	100 5	
c	5.4	+240	+12 6	206 24	107 24	
c <sup>2</sup>	+ 0.5	+252	+10 49	211 24	112 24	
d <sup>1</sup>	11.2	+ 44	- 4 18	215 4	116 4	
d <sup>2</sup>	12.0	+ 92	- 1 54	216 49	117 49	
d <sup>3</sup>	13.7	+ 23	- 6 16	216 38	117 38	
d <sup>4</sup>	14.9	+ 97	- 2 33	219 18	120 18	
d <sup>n</sup>	16.2	+ 74	- 4 55	220 10	121 10	
d <sup>s</sup>	17.5	+ 57	- 6 52	225 7	126 7	
d <sup>5</sup>	22.8	+ 64	- 6 47	228 21	129 21	
d <sup>6</sup>	26.0	+ 82	- 6 47	228 21	129 21	
e	44.2	+104	-11 9	246 46	147 46	
e <sup>1</sup>	46.2	+107	-11 33	249 6	150 6	
f	44.7	+679	+22 46	280 20	181 20	
g	55.8	+505	+ 9 9	286 17	187 17	
May 10 1 <sup>h</sup> 32 <sup>m</sup>						
a	-57.3	-457	- 7 15	124 41	40 10	a b <sup>1</sup> b <sup>2</sup> c <sup>1</sup> c <sup>2</sup> c <sup>3</sup> c <sup>4</sup> c <sup>n</sup> c <sup>s</sup> c <sup>5</sup> d e <sup>n</sup> e <sup>s</sup>
b <sup>1</sup>	27.5	+117	+12 48	184 11	99 40	
b	19.9	+152	+12 7	191 32	107 1	
b <sup>2</sup>	10.5	+191	+11 8	200 7	115 36	
c <sup>1</sup>	3.9	- 62	- 5 8	199 38	115 7	
c <sup>2</sup>	3.4	0	- 1 49	201 20	116 49	
c <sup>3</sup>	0.5	+ 17	- 1 53	204 8	119 37	
c <sup>4</sup>	+ 0.7	- 74	- 7 18	203 1	118 30	
c <sup>n</sup>	1.5	- 11	- 4 49	205 24	120 53	
c <sup>s</sup>	2.9	- 30	- 6 31	212 54	128 23	
c <sup>5</sup>	11.0	0	- 6 31	212 54	128 23	
d	40.0	+652	+22 24	265 39	181 8	
e <sup>n</sup>	52.1	+495	+ 9 6	273 6	188 35	
e <sup>s</sup>	52.9	+486	+ 9 6	273 6	188 35	
May 11 0 <sup>h</sup> 50 <sup>m</sup>						
a	-32.7	+ 77	+12 22	177 39	106 46	a a <sup>1</sup> b <sup>1</sup> b <sup>2</sup> b <sup>3</sup> b <sup>4</sup> b <sup>5</sup> b <sup>n</sup> b <sup>s</sup> b <sup>6</sup> b <sup>7</sup>
a <sup>1</sup>	22.6	+124	+11 31	187 38	116 45	
b <sup>1</sup>	17.6	-133	- 4 29	186 2	115 9	
b <sup>2</sup>	16.9	-101	- 2 56	187 21	116 28	
b <sup>3</sup>	16.1	- 71	- 1 33	188 46	117 53	
b <sup>4</sup>	14.3	- 62	- 1 38	190 24	119 31	
b <sup>5</sup>	13.6	-161	- 7 19	188 34	117 41	
b <sup>n</sup>	12.6	- 92	- 4 34	191 32	120 39	
b <sup>s</sup>	11.0	-108	- 4 34	191 32	120 39	
b <sup>6</sup>	11.0	- 46	- 1 51	193 28	122 35	
b <sup>7</sup>	9.6	- 67	- 3 28	194 6	123 13	
May 12 0 <sup>h</sup> 46 <sup>m</sup>						
b <sup>8</sup>	- 4 <sup>s</sup> 2	- 78''	- 5° 50'	198° 6'	127° 13'	b <sup>8</sup>
c	+22.3	- 44	-12 23	220 31	149 38	d e <sup>n</sup> e <sup>s</sup>
d	33.5	+615	+22 14	252 47	181 54	
e <sup>n</sup>	46.0	+470	+ 9 15	259 58	189 5	
e <sup>s</sup>	47.0	+456				f
May 13 2 <sup>h</sup> 51 <sup>m</sup>						
a	-54.6	- 55	+12 36	148 25	106 47	a b <sup>1</sup> b <sup>2</sup> b <sup>3</sup> b <sup>4</sup> b <sup>n</sup> b <sup>s</sup> b <sup>5</sup> b <sup>6</sup> b <sup>7</sup> b <sup>8</sup> b <sup>9</sup> c c <sup>1</sup> c <sup>2</sup> c <sup>3</sup> c <sup>4</sup> c <sup>5</sup> d d <sup>n</sup> d <sup>s</sup> d <sup>3</sup> e f <sup>1</sup> f <sup>2</sup> f <sup>n</sup> f <sup>s</sup>
b <sup>1</sup>	42.7	-253	- 2 39	157 45	116 17	
b <sup>2</sup>	42.4	-239	- 1 58	158 28	116 50	
b <sup>3</sup>	40.7	-264	- 3 57	159 31	117 53	
b <sup>4</sup>	38.8	-186	- 0 20	163 50	122 12	
b <sup>n</sup>	39.2	-260	- 4 50	161 31	119 53	
b <sup>s</sup>	38.1	-274	- 7 11	160 51	119 13	
b <sup>5</sup>	38.0	-306	- 7 11	160 51	119 13	
b <sup>6</sup>	35.5	-212	- 2 52	166 18	124 40	
b <sup>7</sup>	34.0	-246	- 5 14	166 40	125 2	
b <sup>8</sup>	32.6	-237	- 5 12	168 16	126 38	
b <sup>9</sup>	31.1	-205	- 3 57	170 33	128 55	
c	+12.0	-221	-18 53	206 6	164 28	
c <sup>1</sup>	13.6	-237	-20 20	207 7	165 29	
c <sup>2</sup>	10.7	+480	+21 38	222 7	180 29	
c <sup>3</sup>	11.9	+452	+19 31	222 14	180 36	
c <sup>4</sup>	12.1	+502	+21 55	224 13	182 35	
c <sup>5</sup>	12.9	+487	+21 55	224 13	182 35	
d	14.1	+461	+19 23	224 23	182 45	
e	23.8	- 59	-13 18	219 34	177 56	
f <sup>1</sup>	21.9	+396	+13 3	229 3	187 25	
f <sup>2</sup>	23.5	+324	+ 8 24	228 14	186 36	
f <sup>n</sup>	24.9	+358	+ 9 24	230 45	189 7	
f <sup>s</sup>	26.0	+345	+ 9 24	230 45	189 7	
May 17 2 <sup>h</sup> 14 <sup>m</sup>						
a	-36.5	+195	+20 23	169 45	183 53	b b <sup>n</sup> b <sup>s</sup> c c <sup>1</sup> c <sup>2</sup> c <sup>3</sup> c <sup>4</sup> c <sup>5</sup> d d <sup>1</sup> d <sup>2</sup> d <sup>3</sup> d <sup>4</sup> d <sup>5</sup> d <sup>6</sup> d <sup>7</sup> d <sup>8</sup> d <sup>9</sup> d <sup>10</sup> d <sup>11</sup> d <sup>12</sup> d <sup>13</sup> d <sup>14</sup> d <sup>15</sup> d <sup>16</sup> d <sup>17</sup> d <sup>18</sup> d <sup>19</sup> d <sup>20</sup> d <sup>21</sup> d <sup>22</sup> d <sup>23</sup> d <sup>24</sup> d <sup>25</sup> d <sup>26</sup> d <sup>27</sup> d <sup>28</sup> d <sup>29</sup> d <sup>30</sup> d <sup>31</sup> d <sup>32</sup> d <sup>33</sup> d <sup>34</sup> d <sup>35</sup> d <sup>36</sup> d <sup>37</sup> d <sup>38</sup> d <sup>39</sup> d <sup>40</sup> d <sup>41</sup> d <sup>42</sup> d <sup>43</sup> d <sup>44</sup> d <sup>45</sup> d <sup>46</sup> d <sup>47</sup> d <sup>48</sup> d <sup>49</sup> d <sup>50</sup> d <sup>51</sup> d <sup>52</sup> d <sup>53</sup> d <sup>54</sup> d <sup>55</sup> d <sup>56</sup> d <sup>57</sup> d <sup>58</sup> d <sup>59</sup> d <sup>60</sup> d <sup>61</sup> d <sup>62</sup> d <sup>63</sup> d <sup>64</sup> d <sup>65</sup> d <sup>66</sup> d <sup>67</sup> d <sup>68</sup> d <sup>69</sup> d <sup>70</sup> d <sup>71</sup> d <sup>72</sup> d <sup>73</sup> d <sup>74</sup> d <sup>75</sup> d <sup>76</sup> d <sup>77</sup> d <sup>78</sup> d <sup>79</sup> d <sup>80</sup> d <sup>81</sup> d <sup>82</sup> d <sup>83</sup> d <sup>84</sup> d <sup>85</sup> d <sup>86</sup> d <sup>87</sup> d <sup>88</sup> d <sup>89</sup> d <sup>90</sup> d <sup>91</sup> d <sup>92</sup> d <sup>93</sup> d <sup>94</sup> d <sup>95</sup> d <sup>96</sup> d <sup>97</sup> d <sup>98</sup> d <sup>99</sup> d <sup>100</sup> d <sup>101</sup> d <sup>102</sup> d <sup>103</sup> d <sup>104</sup> d <sup>105</sup> d <sup>106</sup> d <sup>107</sup> d <sup>108</sup> d <sup>109</sup> d <sup>110</sup> d <sup>111</sup> d <sup>112</sup> d <sup>113</sup> d <sup>114</sup> d <sup>115</sup> d <sup>116</sup> d <sup>117</sup> d <sup>118</sup> d <sup>119</sup> d <sup>120</sup> d <sup>121</sup> d <sup>122</sup> d <sup>123</sup> d <sup>124</sup> d <sup>125</sup> d <sup>126</sup> d <sup>127</sup> d <sup>128</sup> d <sup>129</sup> d <sup>130</sup> d <sup>131</sup> d <sup>132</sup> d <sup>133</sup> d <sup>134</sup> d <sup>135</sup> d <sup>136</sup> d <sup>137</sup> d <sup>138</sup> d <sup>139</sup> d <sup>140</sup> d <sup>141</sup> d <sup>142</sup> d <sup>143</sup> d <sup>144</sup> d <sup>145</sup> d <sup>146</sup> d <sup>147</sup> d <sup>148</sup> d <sup>149</sup> d <sup>150</sup> d <sup>151</sup> d <sup>152</sup> d <sup>153</sup> d <sup>154</sup> d <sup>155</sup> d <sup>156</sup> d <sup>157</sup> d <sup>158</sup> d <sup>159</sup> d <sup>160</sup> d <sup>161</sup> d <sup>162</sup> d <sup>163</sup> d <sup>164</sup> d <sup>165</sup> d <sup>166</sup> d <sup>167</sup> d <sup>168</sup> d <sup>169</sup> d <sup>170</sup> d <sup>171</sup> d <sup>172</sup> d <sup>173</sup> d <sup>174</sup> d <sup>175</sup> d <sup>176</sup> d <sup>177</sup> d <sup>178</sup> d <sup>179</sup> d <sup>180</sup> d <sup>181</sup> d <sup>182</sup> d <sup>183</sup> d <sup>184</sup> d <sup>185</sup> d <sup>186</sup> d <sup>187</sup> d <sup>188</sup> d <sup>189</sup> d <sup>190</sup> d <sup>191</sup> d <sup>192</sup> d <sup>193</sup> d <sup>194</sup> d <sup>195</sup> d <sup>196</sup> d <sup>197</sup> d <sup>198</sup> d <sup>199</sup> d <sup>200</sup> d <sup>201</sup> d <sup>202</sup> d <sup>203</sup> d <sup>204</sup> d <sup>205</sup> d <sup>206</sup> d <sup>207</sup> d <sup>208</sup> d <sup>209</sup> d <sup>210</sup> d <sup>211</sup> d <sup>212</sup> d <sup>213</sup> d <sup>214</sup> d <sup>215</sup> d <sup>216</sup> d <sup>217</sup> d <sup>218</sup> d <sup>219</sup> d <sup>220</sup> d <sup>221</sup> d <sup>222</sup> d <sup>223</sup> d <sup>224</sup> d <sup>225</sup> d <sup>226</sup> d <sup>227</sup> d <sup>228</sup> d <sup>229</sup> d <sup>230</sup> d <sup>231</sup> d <sup>232</sup> d <sup>233</sup> d <sup>234</sup> d <sup>235</sup> d <sup>236</sup> d <sup>237</sup> d <sup>238</sup> d <sup>239</sup> d <sup>240</sup> d <sup>241</sup> d <sup>242</sup> d <sup>243</sup> d <sup>244</sup> d <sup>245</sup> d <sup>246</sup> d <sup>247</sup> d <sup>248</sup> d <sup>249</sup> d <sup>250</sup> d <sup>251</sup> d <sup>252</sup> d <sup>253</sup> d <sup>254</sup> d <sup>255</sup> d <sup>256</sup> d <sup>257</sup> d <sup>258</sup> d <sup>259</sup> d <sup>260</sup> d <sup>261</sup> d <sup>262</sup> d <sup>263</sup> d <sup>264</sup> d <sup>265</sup> d <sup>266</sup> d <sup>267</sup> d <sup>268</sup> d <sup>269</sup> d <sup>270</sup> d <sup>271</sup> d <sup>272</sup> d <sup>273</sup> d <sup>274</sup> d <sup>275</sup> d <sup>276</sup> d <sup>277</sup> d <sup>278</sup> d <sup>279</sup> d <sup>280</sup> d <sup>281</sup> d <sup>282</sup> d <sup>283</sup> d <sup>284</sup> d <sup>285</sup> d <sup>286</sup> d <sup>287</sup> d <sup>288</sup> d <sup>289</sup> d <sup>290</sup> d <sup>291</sup> d <sup>292</sup> d <sup>293</sup> d <sup>294</sup> d <sup>295</sup> d <sup>296</sup> d <sup>297</sup> d <sup>298</sup> d <sup>299</sup> d <sup>300</sup> d <sup>301</sup> d <sup>302</sup> d <sup>303</sup> d <sup>304</sup> d <sup>305</sup> d <sup>306</sup> d <sup>307</sup> d <sup>308</sup> d <sup>309</sup> d <sup>310</sup> d <sup>311</sup> d <sup>312</sup> d <sup>313</sup> d <sup>314</sup> d <sup>315</sup> d <sup>316</sup> d <sup>317</sup> d <sup>318</sup> d <sup>319</sup> d <sup>320</sup> d <sup>321</sup> d <sup>322</sup> d <sup>323</sup> d <sup>324</sup> d <sup>325</sup> d <sup>326</sup> d <sup>327</sup> d <sup>328</sup> d <sup>329</sup> d <sup>330</sup> d <sup>331</sup> d <sup>332</sup> d <sup>333</sup> d <sup>334</sup> d <sup>335</sup> d <sup>336</sup> d <sup>337</sup> d <sup>338</sup> d <sup>339</sup> d <sup>340</sup> d <sup>341</sup> d <sup>342</sup> d <sup>343</sup> d <sup>344</sup> d <sup>345</sup> d <sup>346</sup> d <sup>347</sup> d <sup>348</sup> d <sup>349</sup> d <sup>350</sup> d <sup>351</sup> d <sup>352</sup> d <sup>353</sup> d <sup>354</sup> d <sup>355</sup> d <sup>356</sup> d <sup>357</sup> d <sup>358</sup> d <sup>359</sup> d <sup>360</sup> d <sup>361</sup> d <sup>362</sup> d <sup>363</sup> d <sup>364</sup> d <sup>365</sup> d <sup>366</sup> d <sup>367</sup> d <sup>368</sup> d <sup>369</sup> d <sup>370</sup> d <sup>371</sup> d <sup>372</sup> d <sup>373</sup> d <sup>374</sup> d <sup>375</sup> d <sup>376</sup> d <sup>377</sup> d <sup>378</sup> d <sup>379</sup> d <sup>380</sup> d <sup>381</sup> d <sup>382</sup> d <sup>383</sup> d <sup>384</sup> d <sup>385</sup> d <sup>386</sup> d <sup>387</sup> d <sup>388</sup> d <sup>389</sup> d <sup>390</sup> d <sup>391</sup> d <sup>392</sup> d <sup>393</sup> d <sup>394</sup> d <sup>395</sup> d <sup>396</sup> d <sup>397</sup> d <sup>398</sup> d <sup>399</sup> d <sup>400</sup> d <sup>401</sup> d <sup>402</sup> d <sup>403</sup> d <sup>404</sup> d <sup>405</sup> d <sup>406</sup> d <sup>407</sup> d <sup>408</sup> d <sup>409</sup> d <sup>410</sup> d <sup>411</sup> d <sup>412</sup> d <sup>413</sup> d <sup>414</sup> d <sup>415</sup> d <sup>416</sup> d <sup>417</sup> d <sup>418</sup> d <sup>419</sup> d <sup>420</sup> d <sup>421</sup> d <sup>422</sup> d <sup>423</sup> d <sup>424</sup> d <sup>425</sup> d <sup>426</sup> d <sup>427</sup> d <sup>428</sup> d <sup>429</sup> d <sup>430</sup> d <sup>431</sup> d <sup>432</sup> d <sup>433</sup> d <sup>434</sup> d <sup>435</sup> d <sup>436</sup> d <sup>437</sup> d <sup>438</sup> d <sup>439</sup> d <sup>440</sup> d <sup>441</sup> d <sup>442</sup> d <sup>443</sup> d <sup>444</sup> d <sup>445</sup> d <sup>446</sup> 

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1863 May 19—Continued						
$c^s$	-51.2	- 76''	+ 9° 24'	147° 58'	188° 37'	$a$
$c^n$	50.2	- 64				
$d$	47.0	-358	- 7 52	143 36	184 15	
$d^1$	42.4	-358	- 9 21	149 3	189 42	
$e$	0.1	-124	- 8 56	193 1	233 40	$c^1$
$e^1$	+ 6.6	- 97	- 9 20	198 56	239 35	$c^4$
$e^2$	8.1	-101	- 9 59	200 4	240 43	$c^5$
$e^3$	10.6	-103	-10 49	202 4	242 43	$c^6$
May 21 0 <sup>h</sup> 28 <sup>m</sup>						
$a$	-64.1	-142	+ 9 21	120 57	190 11	
$b$	54.6	-228	+ 1 22	136 36	205 50	
$c^1$	29.5	-283	- 9 18	162 41	231 55	
$c^2$	25.8	-264	- 9 20	166 36	235 50	$a^1?$
$c$	23.7	-260	- 9 43	168 33	237 47	
$c^3$	23.7	-241	- 8 38	169 3	238 17	
$c^4$	21.9	-232	- 8 38	170 47	240 1	
$c^5$	20.2	-239	- 9 32	172 3	241 17	$a^3$
$c^6$	17.8	-248	-10 44	173 52	243 6	$a^4$
$c^7$	17.4	-257	-11 23	174 1	243 15	
May 23 23 <sup>n</sup> 45 <sup>m</sup>						
$a$	-47.9	-362	- 8 37	138 51	235 44	
$a^1$	47.6	-371	- 9 13	138 49	235 42	
$a^2$	47.1	-362	- 8 53	139 54	236 47	
$a^3$	43.5	-353	- 9 23	144 32	241 25	
$a^4$	41.5	-355	-10 6	146 42	243 35	
$b^1$	+56.7	+427	+ 8 36	262 48	359 41	$C$
$b$	57.1	+423	+ 8 17	263 23	0 16	
$b^2$	57.4	+416	+ 7 48	263 33	0 26	
$c$	66.5	+ 81	-13 42	271 37	8 30	$d^1$
$c^1$	66.5	+ 65	-14 39	271 12	8 5	$d^2$
May 26 22 <sup>h</sup> 55 <sup>m</sup>						
$a$	- 5.8	+385	+23 4	191 31	330 1	
$b$	+ 0.6	+ 87	+ 3 42	190 59	329 29	$a$
$b^1$	3.5	+ 97	+ 3 32	193 32	332 2	
$c_1$	27.7	+294	+ 8 51	218 2	356 32	
$c_2$	28.4	+311	+ 9 40	219 7	357 37	$b$
$c^1$	30.8	+317	+ 9 24	221 30	0 0	
$c^2$	32.1	+315	+ 8 58	222 41	1 11	
$c^3$	32.5	+324	+ 9 26	223 21	1 51	
$c^4$	33.4	+346	+10 28	224 50	3 20	$b^3$
$d$	42.1	- 11	-10 10	217 4	355 34	
$d^1$	44.0	- 14	-12 57	227 45	6 15	$C$
$d^2$	44.5	- 39	-14 33	227 59	6 29	
$d^3$	48.2	- 9	-14 21	232 24	10 54	

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$e_1^n$	+43.7	+358''	+ 8° 6'	236° 31'	15° 1'	$d$
$e_1^s$	44.9	+344				
$e_2^n$	44.9	+356	+ 7 44	237 39	16 9	
$e_2^s$	45.8	+342				
$f^1$	49.6	+363	+ 7 33	243 38	22 8	
$f^2$	50.8	+390	+ 8 51	246 34	25 4	$d^4$
$f^n$	52.3	+365	+ 6 42	247 19	25 49	$d^5$
$f^s$		+353				
$g$	50.8	+ 40	-11 27	236 30	15 0	
$h^n$	55.9	+131	- 7 36	244 54	23 24	$f$
$h^s$		+122				
$i$	64.5	+ 39	-14 41	259 59	38 29	

May 28 0 <sup>h</sup> 38 <sup>m</sup>						
$a$	-32.4	- 60	+ 3 40	158 49	326 12	
$b$	1.6	+186	+10 15	188 59	356 22	$a$
$b^1$	+ 0.3	+143	+ 7 16	189 45	357 8	$a^3$
$b^2$	4.8	+182	+ 8 27	194 6	1 29	$a^5$
$b^3$	5.7	+212	+10 0	195 21	2 44	$a^6$
$c^1$	10.2	-166	-12 58	192 23	359 46	
$c^2$	15.1	-129	-12 1	197 8	4 31	$b$
$c$	19.6	-136	-13 32	200 51	8 14	
$c^3$	21.9	-129	-13 41	202 57	10 20	
$c^4$	23.8	-139	-14 45	204 29	11 52	$b^3$
$c^5$	24.6	-138	-14 53	205 13	12 36	
$d^n$	18.6	+250	+ 8 12	207 43	15 6	$c$
$d^s$	20.9	+232				
$d^1$	22.2	+200	+ 5 17	208 54	16 17	
$d^2$	24.5	+223	+ 6 4	211 23	18 46	
$d^3$	28.2	+275	+ 8 11	215 53	23 16	$d^1$
$d^4$	29.2	+282	+ 8 18	216 57	24 20	
$d^5$	31.1	+253	+ 6 1	218 51	26 14	$d d^2$
$e$	17.9	+ 48	- 2 27	202 23	9 46	
$e^1$	17.9	+ 76	- 0 50	202 52	10 29	
$f$	33.2	+ 16	- 7 58	215 17	22 40	$e$



Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1863 May 30—Continued						
$d^1$	+ 1 <sup>s</sup> .2	+ 164''	+ 8° 34'	188° 53'	23° 50'	a
d	3.3	+ 128	+ 5 59	189 57	24 54	
$d^2$	4.0	+ 137	+ 6 20	190 41	25 38	
e	4.8	- 107	- 7 57	187 11	22 8	
$e^1$	6.2	- 100	- 7 52	188 28	23 25	
$e^2$	9.5	- 91	- 8 7	191 19	26 16	
f	14.0	+ 175	+ 6 13	199 32	34 29	
g	65.1	+ 114	- 8 49	258 52	93 49	$b_1 b_2$
June 4 0 <sup>h</sup> 9 <sup>m</sup>						
$a^{\text{n}}$	-64.9	- 79	+ 8 12	108 48	14 27	
$a^{\text{s}}$		- 98				
$a^1$	58.2	- 74	+ 7 38	122 26	28 5	
$a^2$	54.0	0	+ 11 8	129 25	35 4	
$b_1$	+ 7.2	- 130	- 9 8	184 17	89 56	} a
$b_2$	7.9	- 116	- 8 26	185 1	90 40	
$b^1$	10.5	- 100	- 8 3	187 26	93 5	
$b^2$	12.5	- 88	- 7 45	189 12	94 51	
$b^3$	13.1	- 121	- 9 35	189 3	94 42	
$b^4$	13.5	- 102	- 8 48	189 53	95 32	
$c^1$	29.9	0	- 6 12	205 25	111 4	
$c^{\text{n}}$	30.4	+ 37	- 5 22	206 52	112 31	} b
$c^{\text{s}}$	31.5	+ 28				
$c_2$	31.5	+ 28	- 4 53	207 16	112 55	
$c^2$	32.9	0	- 6 48	208 8	113 47	
$c^3$	33.5	+ 39	- 4 39	209 16	114 55	
$c^4$	37.0	- 14	- 8 30	211 57	117 36	
$c^5$	39.6	+ 67	- 4 16	215 35	121 14	$b^3$
d	34.7	+ 353	+ 13 31	217 0	122 39	C
June 9 0 <sup>h</sup> 7 <sup>m</sup>						
$a^1$	-57.4	- 329	- 9 1	111 34	87 15	
$a^2$	57.1	- 300	- 7 20	113 27	89 8	
a	56.5	- 322	- 8 46	113 36	89 17	
b	41.8	- 196	- 3 43	136 1	111 42	a
$b^1$	39.0	- 283	- 9 22	137 0	112 41	
$b^2$	38.2	- 242	- 7 4	138 49	114 30	
$b^3$	33.6	- 147	- 2 14	145 1	120 42	
c	38.2	+ 113	+ 13 58	143 33	119 14	b
$c^1$	37.5	+ 129	+ 14 49	144 21	120 2	
$c^2$	36.0	+ 157	+ 16 5	145 54	121 35	$b^1$
$c^3$	35.2	+ 159	+ 16 15	146 50	122 31	$b^2$
d	+ 34.5	+ 247	+ 8 55	209 1	184 42	c
e	47.8	+ 297	+ 9 26	224 33	200 14	
June 11 0 <sup>h</sup> 45 <sup>m</sup>						
a	-60.8	- 236	- 3 38	107 23	111 30	
b	59.1	+ 62	+ 14 0	115 10	119 17	
Letter	$\Delta a$	$\Delta \delta$	h	L	L'	Letter on next date
$b^1$	-58 <sup>s</sup> .0	+ 98''	+ 15° 56'	116° 57'	121° 4'	
$b^2$	57.5	+ 101	+ 16 3	117 48	121 55	
c	+ 5.8	+ 153	+ 8 53	180 18	184 25	c
June 13 2 <sup>h</sup> 31 <sup>m</sup>						
a	-36.1	- 67	+ 2 24	139 57	173 10	$a^?$
$b^1$	30.7	- 237	- 8 30	142 37	175 50	
b	30.0	- 237	- 8 36	143 15	176 28	
$b^2$	26.7	- 243	- 9 26	146 8	179 21	
$b^3$	26.3	- 232	- 8 50	146 40	179 53	$b^2$
$b^4$	26.3	- 250	- 9 55	146 22	179 35	
$b^5$	24.6	- 241	- 9 37	148 3	181 16	$b^3$
$c^1$	30.7	+ 87	+ 10 46	146 26	179 39	$c^1$
c	25.3	+ 62	+ 8 50	151 19	184 32	c
June 15 0 <sup>h</sup> 37 <sup>m</sup>						
a	-53.7	- 114	+ 1 31	118 1	178 11	
b	53.2	- 291	- 9 11	114 46	174 56	
$b^1$	51.6	- 264	- 7 43	117 42	177 52	
$b^2$	49.1	- 284	- 9 13	120 23	180 33	
$b^3$	48.2	- 288	- 9 34	121 24	181 34	
$c^1$	53.2	+ 39	+ 10 37	120 3	180 13	
$c^2$	51.8	+ 53	+ 11 17	121 54	182 4	
c	49.2	+ 22	+ 9 7	124 56	185 6	
$d^1$	+ 11.4	+ 284	+ 16 40	182 45	242 55	$b^1$
$d^2$	12.7	+ 279	+ 16 10	183 47	243 57	$b^2$
$d^3$	13.1	+ 304	+ 17 39	184 29	244 39	
$d^4$	14.6	+ 272	+ 15 28	185 17	245 27	
d	15.2	+ 288	+ 16 39	186 35	246 45	b
e	46.7	- 96	- 11 21	211 23	271 33	
June 18 0 <sup>h</sup> 38 <sup>m</sup>						
a	-55.8	+ 32	+ 9 40	113 25	215 42	
$b^1$	33.7	+ 178	+ 16 16	138 48	241 5	
$b^2$	32.6	+ 183	+ 16 27	139 53	242 10	
$b^3$	31.9	+ 192	+ 16 56	140 35	242 52	
b	28.7	+ 181	+ 15 54	143 37	245 54	a
$b^4$	27.3	+ 218	+ 18 1	145 2	247 19	
$b^5$	26.3	+ 211	+ 17 28	145 57	248 14	
c	+ 27.6	- 54	- 5 3	189 50	292 7	
d	53.6	- 77	- 10 6	217 11	319 28	c
June 20 0 <sup>h</sup> 20 <sup>m</sup>						
a	-52.6	+ 146	+ 15 47	115 26	245 37	
b	+ 10.7	- 283	- 16 29	172 2	302 13	
$b^1$	14.8	- 289	- 17 19	175 39	305 50	
$c^1$	25.0	- 155	- 10 21	185 12	315 23	
c	28.1	- 141	- 9 48	188 2	318 13	b
d	63.9	+ 239	+ 7 31	238 22	8 33	c

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1863 June 22 0 <sup>h</sup> 24 <sup>m</sup>						
a	-15.1	+252"	+18° 48'	151° 56'	310° 13'	b
a <sup>1</sup>	11.1	+240	+17 41	155 26	313 43	b <sup>1</sup>
b	3.5	-201	- 9 40	158 59	317 16	
c <sup>1</sup>	+47.5	+217	+ 9 57	209 18	7 35	
c <sup>n</sup>	47.9	+180				d <sub>1</sub> d <sub>2</sub>
c <sup>s</sup>	48.9	+167	+ 7 14	209 30	7 47	
June 24 0 <sup>h</sup> 50 <sup>m</sup>						
a	-42.5	+ 41	+ 7 54	123 37	310 14	
a <sup>1</sup>	40.1	+ 34	+ 7 20	126 4	312 41	
b	42.1	+211	+18 16	123 29	310 6	a
b <sup>1</sup>	38.3	+208	+17 51	128 41	315 18	
c <sup>1</sup>	+17.0	+227	+14 29	177 29	4 6	c <sup>1</sup>
c <sup>2</sup>	22.4	+244	+15 0	182 30	9 7	
c	26.0	+263	+15 49	186 4	12 41	
d <sub>1</sub> <sup>n</sup>	21.3	+112				d
d <sub>1</sub> <sup>s</sup>	22.4	+103	+ 6 48	180 30	7 7	
d <sub>2</sub>	22.4					d <sup>2</sup>
d <sub>2</sub>	23.3	+112	+ 6 58	181 25	8 2	
d <sup>1</sup>	25.4	+ 94	+ 5 39	183 32	10 9	
e <sup>n</sup>	64.2	+ 30				
e <sup>s</sup>	65.7	+ 7	- 3 36	231 27	58 4	
June 26 0 <sup>h</sup> 48 <sup>m</sup>						
a	-60.4	+211	+18 16	95 33	310 12	
b <sup>1</sup>	57.0	-369	-17 26	95 42	310 21	
b <sup>2</sup>	54.9	-385	-18 29	98 54	313 33	
b	54.4	-362	-16 58	100 46	315 25	
c <sup>1</sup>	12.6	+188	+14 45	149 38	4 17	a <sup>2</sup>
c <sup>2</sup>	11.9	+184	+14 27	150 17	4 56	
c	10.9	+182	+14 16	151 6	5 45	a
c <sup>3</sup>	9.7	+201	+15 22	152 12	6 51	a <sup>3</sup>
d <sup>n</sup>	9.8	+ 71				b
d <sup>s</sup>	8.6	+ 62	+ 7 9	152 8	6 47	
d <sup>1</sup>	8.6	+ 27	+ 4 45	152 28	7 7	
d <sup>2</sup>	7.4	+ 74	+ 7 29	153 43	8 22	b <sup>1</sup>
d <sup>3</sup>	4.6	+ 87	+ 8 5	156 7	10 46	
e	+13.7	+283	+18 43	172 59	27 38	c <sup>1</sup>
e <sup>1</sup>	16.3	+279	+18 15	175 16	29 55	c
f <sup>1</sup>	17.0	-293	-15 59	172 42	27 21	d <sup>2</sup>
f	19.8	-274	-15 39	175 12	29 51	d <sup>3</sup>
June 28 0 <sup>h</sup> 49 <sup>m</sup>						
a <sup>1</sup>	-41.5	+154	+13 53	120 17	3 1	a
a <sup>2</sup>	40.6	+159	+14 10	121 12	3 56	
a	38.5	+170	+14 48	123 21	6 5	
a <sup>3</sup>	37.4	+184	+15 36	124 24	7 8	
Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
a <sup>4</sup>	-35.1	+191"	+15° 58'	126° 43'	9° 27'	a <sup>1</sup>
a <sup>5</sup>	33.9	+184	+15 29	128 0	10 44	
b <sup>n</sup>	39.1	+ 34	+ 6 12	123 28	6 12	b
b <sup>s</sup>	38.4	+ 23				
b <sup>1</sup>	36.2	+ 48	+ 7 18	126 1	8 45	
b <sup>2</sup>	34.4	+ 24	+ 5 48	127 44	10 28	
c <sup>1</sup>	17.3	+223	+17 12	143 28	26 12	
c <sup>2</sup>	16.5	+168	+13 47	144 9	26 53	
c	12.7	+237	+17 51	147 31	30 15	
d <sup>1</sup>	15.2	-319	-16 13	142 58	25 42	
d	14.2	-317	-15 52	143 54	26 38	
d <sup>2</sup>	11.4	-313	-15 44	146 23	29 7	
d <sup>3</sup>	10.5	-315	-15 55	147 12	29 56	
e	+50.9	-189	-12 32	205 17	88 1	d
e <sup>1</sup>	52.6	-195	-13 5	207 37	90 21	
e <sup>2</sup>	54.4	-175	-12 2	209 54	92 38	
June 30 3 <sup>h</sup> 9 <sup>m</sup>						
a	-60.6	+163	+13 51	91 50	4 0	
a <sup>1</sup>	57.3	+193	+15 49	97 10	9 20	
a <sup>2</sup>	56.2	+202	+16 23	98 46	10 56	
b	60.3	+ 32	+ 5 58	94 22	6 32	
c	48.5	+ 57	+ 7 39	110 46	22 56	
c <sup>1</sup>	45.4	+ 64	+ 8 4	114 17	26 27	
d	+23.0	-225	-11 50	174 40	86 50	
e	26.1	+285	+18 58	180 9	92 19	
e <sup>1</sup>	28.0	+301	+19 51	182 13	94 23	
f	45.0	+232	+14 19	198 51	111 1	c
July 2 0 <sup>h</sup> 41 <sup>m</sup>						
a	+ 5.8	+156	+12 27	159 5	97 53	
b	15.2	- 37	0 27	166 26	105 14	
c	21.2	+205	+14 49	172 48	111 36	
d <sup>1</sup>	40.9	+290	+18 56	193 30	132 18	b
d	42.6	+299	+19 15	195 35	134 23	b <sup>1</sup>
e	44.9	+ 18	+ 2 11	194 30	133 18	c
e <sup>1</sup>	48.4	+ 41	+ 3 18	198 36	137 24	
July 5 1 <sup>h</sup> 24 <sup>m</sup>						
a <sup>1</sup>	-44.7	+155	+12 30	109 25	90 44	
a <sup>2</sup>	43.9	+153	+12 24	110 20	91 39	
a	40.2	+172	+13 40	114 7	95 26	
b	0.9	+247	+18 36	150 19	131 38	
b <sup>1</sup>	+ 2.2	+256	+19 8	153 3	134 22	
c	0.1	- 14	+ 2 42	150 59	132 18	
d	16.5	+ 60	+ 6 53	164 56	146 15	
d <sup>1</sup>	18.8	+ 51	+ 6 18	166 54	148 13	
d <sup>2</sup>	22.9	+ 87	+ 8 21	170 34	151 53	
e	23.5	-227	-10 42	171 4	152 23	

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1863 July 5—Continued						
$e^1$	+26.3	-247"	-12° 2'	173° 40'	154° 59'	
$f^{\text{ n}}$	63.5	+220	+13 21	223 20	204 39	$b$
$f^{\text{ s}}$		+204				
$f^1$	64.6	+256	+15 42	229 42	211 1	$c$
July 9 1 <sup>h</sup> 2 <sup>m</sup>						
$a$	-50.2	+90	+7 16	99 30	136 44	
$a^1$	48.6	+71	+6 15	101 33	138 47	
$a^2$	47.7	+60	+5 39	102 42	139 56	
$a^3$	47.2	+92	+7 37	103 1	140 15	
$a^4$	46.3	+94	+7 48	104 2	141 16	
$b^1$	+22.0	+183	+15 11	166 16	203 30	
$b^{\text{ n}}$	23.5	+154	+12 58	168 0	205 14	$a$
$b^{\text{ s}}$	24.7	+140				
$c^1$	28.9	+200	+16 11	172 48	210 2	
$c^2$	30.4	+147	+12 56	173 54	211 8	$a^4$
$c^{\text{ n}}$	30.4	+197	+15 16	174 43	211 57	$a^3$
$c^{\text{ s}}$	31.5	+174				
$d$	34.2	-270	-12 31	178 10	215 24	$B$
$d^1$	34.9	-266	-12 16	178 53	216 7	
$d^2$	37.2	-286	-13 35	181 24	218 38	
$d^3$	38.7	-283	-13 26	183 1	220 15	
July 14 1 <sup>h</sup> 29 <sup>m</sup>						
$a^{\text{ s}}$	-45.3	+227	+14 59	98 23	206 3	
$a^{\text{ n}}$	44.5	+236				
$a^1$	43.1	+204	+13 30	100 58	208 38	
$a^2$	42.8	+98	+7 11	102 48	210 28	
$a^3^{\text{ s}}$	40.5	+227	+15 30	103 54	211 34	
$a^4^{\text{ n}}$	39.6	+236				
$a^5$	39.7	+190	+13 1	104 55	212 35	
$a^6$	36.5	+252	+17 5	107 14	214 54	
$a^7$	25.8	+286	+20 8	117 32	225 12	
$b$	25.8	+259	+18 29	117 55	225 35	
$b^1$	45.0	-187	-10 19	101 17	208 57	
$b^2$	35.2	-231	-12 2	111 37	219 17	
$b^3$	32.3	-298	-16 0	114 14	221 54	
$c^{\text{ s}}$	+50.9	-387	-18 14	196 59	304 39	$b$
$c^{\text{ n}}$	51.8	-373				
July 18 23 <sup>h</sup> 33 <sup>m</sup>						
$a$	-20.7	+140	+11 24	119 49	282 29	$a$
$a^1$	20.0	+152	+12 11	120 20	283 0	$a^1$
$a^2$	18.3	+136	+11 24	122 0	284 40	$a^2$
$a^3$	18.0	+136	+11 25	122 16	284 56	$a^3$
$b^{\text{ s}}$	+1.7	-394	-18 48	143 1	305 41	$b$
$b^{\text{ n}}$	3.2	-378				
July 20 0 <sup>h</sup> 44 <sup>m</sup>						
$a$	-47.9	+198	+11 0	89 8	280 34	
$a^1$	47.3	+204	+11 27	89 45	281 11	
$a^2$	44.7	+209	+12 10	92 43	284 9	
$a^3$	44.4	+211	+12 21	93 6	284 32	
$b^{\text{ s}}$	28.1	-342	-18 29	114 2	305 28	$a$
$b^{\text{ n}}$	26.9	-327				
July 22 0 <sup>h</sup> 34 <sup>m</sup>						
$a^{\text{ n}}$	-51.0	-273	-19 0	86 26	305 50	$a$
$a^{\text{ s}}$	50.1	-285				
$b^1$	6.0	-3	+4 22	129 46	349 10	
$b$	5.1	-17	+3 37	130 36	350 0	
July 24 1 <sup>h</sup> 3 <sup>m</sup>						
$a^{\text{ n}}$	-63.9	-196	-18 28	59 1	306 56	
$a^{\text{ s}}$	+59.0	-210				
$b$	+59.0	+23	+10 45	194 22	82 8	$b^1$
July 26 1 <sup>h</sup> 41 <sup>m</sup>						
$a$	-36.5	+286	+16 49	93 33	9 45	
$b^1$	+40.0	+9	+10 5	167 21	83 33	$A$
$b$	40.5	+72	+13 55	167 48	84 0	
$b^2$	41.3	+25	+11 8	168 46	84 58	
$c$	66.1	-14	+8 37	211 19	127 31	$b$
$d^{\text{ n}}$	66.6	-79	+3 29	215 59	132 11	$c$
$d^{\text{ s}}$		-107				
July 28 1 <sup>h</sup> 7 <sup>m</sup>						
$a$	+11.4	+36	+9 19	138 23	82 19	
$a^1$	13.2	+16	+8 21	140 7	84 3	
$b^{\text{ n}}$	54.0	-41	+8 9	183 3	126 59	$a$
$b^{\text{ s}}$		-52				
$c$	56.4	-134	+2 54	187 34	131 30	$b$
$d$	63.2	+2	+10 54	200 8	144 4	$c_1 c_2$
$d^1$	64.7	+34	+12 36	204 50	148 46	$c^3$
Aug. 2 1 <sup>h</sup> 7 <sup>m</sup>						
$a^{\text{ s}}$	-13.7	+89	+9 8	111 44	125 50	$b$
$a^{\text{ n}}$	12.8	+99				
$b^{\text{ n}}$	10.8	-9	+3 19	115 32	129 38	$a$
$b^{\text{ s}}$	10.2	-19				
$b^1$	7.5	-35	+2 38	118 22	132 28	
$c_1$	+3.9	+75	+11 4	126 39	140 45	$c$
$c_2$	4.5	+78	+11 21	127 7	141 13	



1863 Aug. 2—Continued

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$c^1$	+ 5 <sup>s</sup> .6	+ 59''	+ 10° 25'	128° 17'	142° 23'	$c^3$
$c^2$	11.1	+ 63	+ 11 32	133 0	147 6	
$c^3$	12.3	+ 73	+ 12 19	133 57	148 3	
$c^4$	13.8	+ 101	+ 14 13	135 0	149 6	
$d$	30.6	- 139	+ 2 19	152 48	156 54	$d$
$e$	61.1	+ 21	+ 14 10	191 26	205 32	
$f^1$	64.6	- 94	+ 6 51	201 43	215 49	
$f^2$	65.1	- 49	+ 9 29	203 16	217 22	
$f_1^{\text{ns}}$	65.1	- 92	+ 6 49	204 6	218 12	$f$
		- 115				

Aug. 7 0<sup>h</sup> 16<sup>m</sup>

$a$	-61.7	+ 231	+ 2 48	44 42	128 28	$a^1$
$b$	59.6	+ 336	+ 9 19	43 24	127 10	
$c$	55.7	+ 331	+ 10 50	53 19	137 5	
$c^1$	54.4	+ 339	+ 11 46	55 21	139 7	
$c^2$	53.2	+ 373	+ 14 3	55 25	139 11	$a^2$
$c^3$	52.7	+ 324	+ 11 33	58 58	142 44	
$d$	+ 6.6	+ 141	+ 15 55	123 10	206 56	
$e$	11.0	+ 196	+ 20 3	126 24	210 10	
$f^1$	12.9	- 21	+ 7 34	130 44	214 30	$a$
$f^2$	14.0	- 14	+ 8 10	131 36	215 22	
$f^3$	14.0	- 30	+ 7 14	131 49	215 35	
$f^4$	15.7	- 28	+ 7 39	133 16	217 2	
$f$	16.5	- 7	+ 9 1	133 41	217 27	$a^4$
$f^5$	17.3	- 21	+ 8 21	134 36	218 22	
$f^6$	20.1	- 88	+ 4 53	137 56	221 42	
$f^7$	24.3	+ 7	+ 10 20	136 1	219 47	
$f^8$	25.7	- 9	+ 10 28	142 6	225 52	$a^7$

August 9 0<sup>h</sup> 31<sup>m</sup>

$a^1$	-17.8	+ 88	+ 7 32	100 57	212 56	$a^1$
$a^2$	15.9	+ 95	+ 8 22	102 26	214 25	
$a^3$	13.9	+ 37	+ 5 30	105 12	217 11	
$a$	13.0	+ 102	+ 9 28	104 52	216 51	
$a^4$	12.1	+ 91	+ 9 2	105 48	217 47	$a$
$a^5$	8.1	+ 95	+ 10 12	109 12	221 11	
$a^6$	6.1	+ 100	+ 10 56	110 49	222 48	
$a^7$	3.8	+ 68	+ 9 34	113 15	225 14	
$b$	+ 50.1	- 346	- 6 1	173 24	285 23	$c$
$b^1$	52.1	- 362	- 6 54	177 13	289 12	
$b^2$	52.4	- 346	- 5 52	177 3	289 2	
$c$	52.7	- 529	- 18 23	191 1	303 0	
$d$	57.1	- 412	- 10 16	191 4	303 3	$e$
$d^1$	58.0	- 394	- 9 7	192 24	304 23	

August 11 1<sup>h</sup> 12<sup>m</sup>

$a^1$	-39 <sup>s</sup> .1	+ 154''	+ 5° 23'	77° 29'	217° 56'	$a^?$
$a$	38.5	+ 224	+ 9 30	76 18	216 45	
$a^2$	32.2	+ 184	+ 9 4	83 43	224 10	
$x$	19.4	- 646	- 1 52	68 40	209 7	
$b^1$	+ 4.3	+ 163	+ 17 0	116 39	257 6	$b$
$b$	6.9	+ 182	+ 18 42	118 42	259 9	
$c$	26.7	- 295	- 5 28	143 41	284 8	
$c^1$	30.0	- 329	- 6 58	147 40	288 7	
$c^2$	31.6	- 334	- 7 0	149 23	289 50	$c^3$
$d$	38.5	- 529	- 18 24	163 41	304 8	
$e$	41.4	- 420	- 10 54	162 40	303 7	
$e^1$	42.2	- 404	- 9 48	163 2	303 29	
$e^2$	44.0	- 401	- 9 26	165 27	305 54	$d$
$e^3$	47.0	- 434	- 11 12	170 46	311 13	
$f_1$	56.7	- 182	+ 5 11	177 36	318 3	
$f_2^{\text{ns}}$	57.3	- 186	+ 5 30	178 42	319 9	
$g$	59.4	+ 31	+ 18 5	180 38	321 5	$g$
$g^1$	61.2	+ 51	+ 19 17	184 55	325 22	

August 13 0<sup>h</sup> 44<sup>m</sup>

$a^1$	-54.0	+ 308	+ 8 20	51 6	218 21	$a$
$a$	52.8	+ 322	+ 9 31	52 27	219 42	
$a^2$	51.7	+ 304	+ 9 0	55 9	222 24	
$b$	25.3	+ 288	+ 16 41	85 36	252 51	
$c_1$	1.4	- 202	- 5 25	115 46	283 1	$b^1$
$c_2$	0.7	- 204	- 5 23	116 21	283 36	
$c^1$	+ 0.7	- 208	- 5 18	117 23	284 48	
$c^2$	3.6	- 220	- 5 21	120 12	287 27	
$c^3$	5.6	- 240	- 6 5	122 14	289 29	$b^?$
$d$	16.5	- 475	- 18 13	136 50	304 5	
$e^1$	15.9	- 356	- 10 51	133 23	300 38	
$e^2$	17.4	- 343	- 9 44	134 29	301 44	
$e^3$	18.6	- 367	- 10 57	136 6	303 21	$d$
$e$	20.6	- 345	- 9 12	137 26	304 41	
$f_1$	37.1	- 163	+ 4 38	149 47	317 2	
$f_2^{\text{ns}}$	37.6	- 160	+ 5 27	150 44	317 59	
$g$	40.9	+ 62	+ 18 34	151 22	318 37	$f$
$g^1$	46.2	+ 76	+ 20 13	157 52	325 7	

August 15 3<sup>h</sup> 30<sup>m</sup>

$a^1$	-48.5	+ 418	+ 15 46	51 47	249 46	$a$
$a^2$	47.5	+ 411	+ 15 47	53 42	251 41	
$a^3$	46.8	+ 430	+ 17 3	53 32	251 31	
$a$	45.5	+ 421	+ 17 5	55 54	253 53	
$b^1$	30.7	- 65	- 5 15	86 3	284 2	$e^2$

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1863 August 15—Continued						
$b$	-26.0	- 81''	- 4° 47'	90° 42'	288° 41'	
$c$	17.8	-254	-12 41	100 41	298 40	
$d$	11.8	-355	-17 16	107 30	305 29	$a$
$e_1$	+ 8.1	- 67	+ 4 48	119 30	317 29	$b^1$
$e_2$	8.8	- 63	+ 5 13	120 4	318 3	$b^2$
$e_3^s$		- 58				
$e_3^s$	9.4	- 44	+ 6 3	120 23	318 22	$b$
$f$	12.8	+157	+18 56	120 9	318 8	
$g^1$	20.0	+187	+22 23	126 26	324 25	
$g$	21.5	+171	+21 45	128 2	326 1	
$h$	21.3	-405	-12 21	137 43	335 42	
$i$	49.5	-484	-12 57	174 26	12 25	$d$
$i^1$	51.8	-506	-14 26	181 4	19 3	$d^3$
$i^2$	51.8	-520	-15 27	182 34	20 33	$d^2$
August 17 0 <sup>h</sup> 48 <sup>m</sup>						
$a$	-36.0	-235	-17 18	81 24	305 49	
$b^1$	19.2	+ 37	+ 3 47	92 50	317 15	
$b^2$	18.2	+ 39	+ 4 10	93 37	318 2	
$b_1^s$	17.6	+ 64	+ 5 18	93 48	318 13	
$b^3$	15.7	+ 97	+ 8 10	94 38	319 3	
$b^4$	12.4	+ 64	+ 7 12	98 7	322 32	
$c^s$	+ 7.3	-248				
$c^s$	8.1	-234	- 5 13	120 31	344 56	
$c^1$	9.4	-243	- 4 56	121 58	346 23	
$c^2$	10.8	-273	- 6 23	123 44	348 9	
$c^3$	12.5	-275	- 6 5	125 17	349 42	
$d$	31.4	-468	-13 52	148 2	12 27	
$d^1$	35.6	-508	-15 37	154 8	18 33	
$d^2$	36.5	-525	-16 40	156 8	20 33	
$d^3$	37.0	-492	-14 25	155 15	19 40	
$e^1$	32.4	+ 29	+15 58	138 37	3 2	
$e$	35.6	+ 25	+16 22	142 0	6 25	
$f^1$	40.7	- 39	+13 32	148 19	12 44	
$f$	41.5	- 34	+13 58	149 7	13 32	
$f^2$	44.1	- 90	+11 7	152 55	17 20	
1864 November 2 0 <sup>h</sup> 31 <sup>m</sup>						
$a$	-15.5	+149	+ 6 28	17 15	338 34	$a$
$a^1$	15.2	+133	+ 5 40	17 55	339 14	
$a^2$	13.5	+131	+ 6 9	19 17	340 36	
$a^3$	7.7	+117	+ 7 31	24 16	345 35	
$a^4$	6.5	+110	+ 7 35	25 22	346 41	
$b$	7.3	-223	-10 38	32 53	354 12	
$b^1$	6.2	-216	- 9 52	33 34	354 53	
$b^2$	3.1	-232	- 9 39	36 22	357 41	
Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$c_1^s$	+45.0	-228''	+ 6° 56'	77° 59'	39° 18'	$b_1$
		-207				
$c_2$	45.6	-211	+ 7 28	78 30	39 49	$b_2$
$c^1$	48.6	-223	+ 7 44	82 25	43 44	
$c^2$	49.1	-198	+ 9 13	82 23	43 42	$b^3$
$d$	59.6	-237	+ 9 47	100 19	61 38	$c$
$d^1$	61.4	-266	+ 8 28	105 54	67 13	$c^2$
November 6 23 <sup>h</sup> 49 <sup>m</sup>						
$a$	-54.0	+456	+ 7 44	321 16	338 19	
$b^1$	7.7	+ 86	+ 5 34	21 8	38 11	
$b_1^s$	5.8	+ 95	+ 7 17	22 42	39 45	$a$
$b_1^s$	4.5	+109				
$b_2$	3.9	+120	+ 8 40	23 14	40 17	$a^1$
$b^2$	2.3	+132	+ 9 52	24 11	41 14	
$b^3$	2.3	+116	+ 9 0	24 35	41 38	$a^4$
$c^s$	+19.2	+ 12				
$c^s$	20.0	- 5	+10 13	44 40	61 43	$b$
$c^1$	22.9	- 25	+ 9 44	48 4	65 7	
$c^2$	24.0	- 48	+ 8 50	49 30	66 33	
November 7 2 <sup>h</sup> 12 <sup>m</sup>						
$a^s$	-20.5	+201				
$a^s$	19.4	+211	+ 7 39	7 13	39 41	$a$
$a^1$	18.8	+224	+ 9 1	7 38	40 6	$a^1$
$a^2$	18.7	+188	+ 7 8	8 42	41 10	
$a^3$	17.5	+224	+ 9 30	8 43	41 11	$a^2$
$a^4$	16.9	+233	+10 10	8 55	41 23	
$b_2^s$	+ 4.1	+113				
$b_2^s$	4.7	+ 98	+10 35	29 2	61 30	$b$
$b^1$	4.7	+ 58	+ 8 7	30 22	62 50	
November 10 1 <sup>h</sup> 49 <sup>m</sup>						
$a$	-51.6	+410	+ 7 11	325 2	39 23	
$a^1$	50.8	+424	+ 8 29	325 7	39 28	
$a^2$	49.8	+431	+ 8 58	326 22	40 43	
$a^3$	49.4	+458	+10 31	325 19	39 40	
$b^s$	35.8	+360				
$b^s$	35.1	+346	+10 9	346 10	60 31	
$c^1$	36.6	+111	- 3 10	352 24	66 45	
$c^2$	35.3	+109	- 2 45	353 40	68 1	
$c^3$	34.9	+ 72	- 4 41	354 55	69 16	
$c^4$	34.0	+ 44	- 5 53	356 23	70 44	
$c$	33.3	+ 63	- 4 36	356 38	70 59	
$d$	+37.9	-440	- 9 31	69 4	143 25	$a$
$d^1$	39.3	-516	-13 29	74 5	148 26	
$d^2$	40.6	-494	-11 50	74 28	148 49	

1864 November 14 23<sup>h</sup> 38<sup>m</sup>

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$a^1$	-14 <sup>s</sup> .1	- 60''	- 5° 0'	11° 25'	140° 38'	
$a$	12.8	-132	- 8 32	14 0	143 13	
$a^2$	11.2	-120	- 7 23	14 58	144 11	
$a^3$	11.2	-151	- 9 7	15 37	144 50	
$a^4$	9.1	- 83	- 4 42	15 51	145 4	
$b^1$	+45.8	-476	-10 30	75 30	204 43	$a_1$
$b^2$	46.3	-479	-10 33	76 15	205 28	$a_2$
$b$	47.5	-510	-12 2	79 47	209 0	$a^1$

November 18 2<sup>h</sup> 8<sup>m</sup>

$a_1$	- 8.8	-170	- 9 47	13 38	200 27	$b$
$a_2$	7.7	-175	- 9 45	14 34	201 23	
$a^1$	0.8	-248	-11 51	21 32	208 21	
$b^1$	+42.8	+ 23	+15 25	53 23	240 12	$b^2$
$b^2$	44.8	- 23	+13 21	56 11	243 0	
$b$	46.1	- 16	+14 6	57 29	244 18	$d$

November 19 0<sup>h</sup> 27<sup>m</sup>

$a^1$	-57.0	+182	- 5 2	319 0	158 52	$a$
$a$	55.4	+157	- 5 52	321 59	161 51	
$b^1$	22.6	- 85	- 9 9	0 48	200 40	
$b^2$	20.5	- 95	- 9 9	0 48	200 40	
$b^1$	20.0	-109	- 9 35	2 22	202 14	
$b^2$	14.2	-161	-10 59	8 7	207 59	$b^4b^5$
$c$	+17.2	-365	-13 31	37 48	237 40	
$d$	35.1	+ 46	+14 20	44 24	244 16	$c$

November 22 2<sup>h</sup> 2<sup>m</sup>

$a^1$	-58.5	+103	- 9 10	315 52	198 45	$a^?$
$a^2$	57.3	+ 70	-10 37	318 20	201 13	
$a$	57.0	+ 98	- 8 58	318 13	201 6	
$b^1$	30.9	-121	-13 38	350 3	232 56	
$b^2$	29.9	-129	-13 47	351 7	234 0	
$b^3$	28.8	-118	-12 51	351 52	234 45	$a^3$
$b^4$	26.7	-147	-13 53	354 13	237 6	
$b^5$	26.2	-150	-13 56	354 39	237 32	
$b^6$	24.5	-154	-13 29	356 7	239 0	
$b^7$	23.2	-122	-11 29	356 46	239 39	
$b$	22.7	-136	-12 8	357 25	240 18	$a^2$
$c$	12.5	+301	+15 0	356 48	239 41	

November 25 2<sup>h</sup> 26<sup>m</sup>

$a$	-61.5	+ 25	-13 42	309 32	234 46	
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Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$a^1$	-58 <sup>s</sup> .6	+ 12''	-13° 35'	314° 31'	239° 45'	
$a^2$	57.6	+ 14	-13 11	315 56	241 10	
$a^3$	57.6	+ 30	-12 16	315 42	240 56	
$b$	9.3	-289	-17 29	7 50	293 4	
$c^1$	+28.5	+ 61	+12 3	31 59	317 13	$a$
$c^2$	29.4	+ 53	+11 34	32 58	318 12	$a^1$
$c^3$	31.3	+ 70	+13 1	34 25	319 39	$a^2$
$c^4$	31.5	+ 53	+12 6	34 50	320 4	$a^3$
$c^5$	34.9	+ 30	+11 38	38 15	323 29	$a^5$
$d^1$	50.5	- 5	+13 3	55 37	340 51	$b$
$d^2$	51.3	- 23	+13 3	55 37	340 51	
$d^3$	53.3	- 35	+12 25	58 48	344 2	
$d^4$	55.4	- 79	+10 24	62 14	347 28	$b^1?$
$d^5$	56.4	- 63	+11 34	63 26	348 40	$b^4b^5$

December 1 23<sup>h</sup> 58<sup>m</sup>

$a^1$	-52.5	+396	+11 25	306 19	314 18	$a$
$a^2$	50.6	+397	+11 32	309 11	317 10	
$a^3$	49.4	+413	+12 45	310 7	318 6	
$a^4$	44.9	+383	+12 4	316 43	324 42	
$a^5$	44.8	+430	+14 48	314 56	322 55	
$a^6$	44.2	+428	+14 49	315 43	323 42	$a$
$a^7$	43.6	+406	+13 42	317 22	325 21	
$b^1$	31.1	+351	+13 4	332 18	340 17	
$b^2$	30.1	+335	+ 9 51	335 11	343 10	
$b^3$	27.1	+273	+11 2	337 5	345 4	
$b^4$	26.7	+292	+11 6	338 35	346 34	$a$
$b^5$	25.1	+287	+11 59	339 2	347 1	
$b^6$	24.3	+299	+11 51	340 11	348 10	
$b^7$	23.1	+292	+13 9	341 15	349 14	
$b^8$	21.4	+308	+10 23	42 8	50 7	
$c^1$	+44.2	+ 7	+10 26	44 28	52 27	$a$
$c^2$	44.9	- 2	+10 39	45 16	53 15	
$d$	46.7	- 5				
$d^1$	43.7	-225				

December 8 0<sup>h</sup> 23<sup>m</sup>

$a$	-52.2	+335	+ 9 32	303 28	49 56	$a$
$a^1$	51.2	+360	+11 9	303 50	50 18	

December 9 0<sup>h</sup> 43<sup>m</sup>

$a$	-60.2	+357	+ 9 42	289 9	49 51	
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Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date	
1864 December 13 0 <sup>h</sup> 18 <sup>m</sup>							
a	+19.6	-161''	- 7° 20'	9° 30'	186° 5'	A	
a <sup>1</sup>	19.6	-177	- 8 14	9 46	186 21		
a <sup>2</sup>	20.4	-158	- 7 1	10 10	186 45		
a <sup>3</sup>	20.8	-129	- 5 17	10 7	186 42		
a <sup>4</sup>	21.5	-152	- 6 31	11 0	187 35		
a <sup>5</sup>	22.6	-138	- 5 32	11 44	188 19		
a <sup>6</sup>	22.9	-177	- 7 44	12 29	189 4		
a <sup>7</sup>	23.9	-140	- 5 27	12 51	189 26		
December 18 0 <sup>h</sup> 4 <sup>m</sup>							
a <sup>1</sup>	-56.1	+ 32	- 5 41	295 3	181 40	A	
a	52.8	- 32	- 9 8	299 30	186 7		
a <sup>2</sup>	51.9	+ 18	- 6 7	300 21	186 58		
a <sup>3</sup>	51.4	- 32	- 9 1	301 9	187 46		
a <sup>4</sup>	50.8	+ 31	- 5 16	301 32	188 9		
a <sup>5</sup>	49.6	- 46	- 9 37	303 15	189 52		
a <sup>6</sup>	49.2	- 21	- 8 8	303 37	190 14		
a <sup>7</sup>	48.7	0	- 6 51	304 9	190 46		
December 20 0 <sup>h</sup> 20 <sup>m</sup>							
a <sup>1</sup>	-67.8	- 2	-10 6	272 21	187 12	a	
a	67.9	- 43	- 7 42	272 49	187 40		
a <sup>2</sup>	67.5	+ 20	- 6 25	273 39	188 30		
a <sup>3</sup>	66.2	- 14	- 8 22	276 38	191 29		
b	+69.3	+ 92	+12 9	61 44	336 35		
b <sup>1</sup>	69.6	+105	+13 0	63 22	338 13		
b <sup>2</sup>	70.0	+ 75	+11 18	64 25	339 16		
December 22 1 <sup>h</sup> 21 <sup>m</sup>							
a <sup>1</sup>	+54.9	+166	+13 17	32 44	336 15	a	
a	54.9	+147	+12 9	32 38	336 9		
a <sup>2</sup>	56.3	+136	+11 41	34 27	337 58		
a <sup>3</sup>	56.7	+200	+15 35	35 30	339 1		
a <sup>4</sup>	56.8	+170	+13 47	35 20	338 51		
a <sup>5</sup>	59.2	+184	+14 58	39 1	342 32		
December 25 23 <sup>h</sup> 45 <sup>m</sup>							
a <sup>1</sup>	+13.3	+275	+14 38	349 24	334 4	a <sup>2</sup>	
a <sup>2</sup>	13.6	+229	+11 53	349 44	334 24		
a <sup>3</sup>	15.4	+291	+15 47	351 9	335 49		
a	16.3	+232	+12 16	351 59	336 39		
a <sup>4</sup>	18.0	+223	+11 53	353 29	338 9		
a <sup>5</sup>	22.2	+266	+14 48	356 58	341 38		
b	68.6	-156	- 4 52	57 19	41 59		
December 27 2 <sup>h</sup> 22 <sup>m</sup>							
a <sup>1</sup>	-21.7	+290''	+13° 14'	318° 18'	332° 34'	a	
a <sup>2</sup>	19.9	+306	+14 17	319 42	333 58		
a <sup>3</sup>	18.9	+302	+14 5	320 36	334 52		
a <sup>4</sup>	18.5	+272	+12 17	321 12	335 28		
a	17.7	+283	+13 0	321 47	336 3		
a <sup>5</sup>	10.6	+309	+14 54	327 35	341 51		
b <sub>1</sub>	+52.7	- 97	- 4 35	25 55	40 11		b
b <sub>2</sub>	53.3	- 99	- 4 39	26 39	40 55		
b <sup>1</sup>	56.2	-113	- 5 9	30 30	44 46		
December 31 2 <sup>h</sup> 16 <sup>m</sup>							
a	-55.4	+333	+16 21	278 21	348 42	B	
b	4.8	- 44	- 5 55	329 50	40 11		
b <sup>1</sup>	1.0	- 51	- 6 14	332 57	43 18		
c <sup>1</sup>	+66.2	+ 99	+ 6 29	42 26	112 47		
c	66.7	+104	+ 6 52	43 41	114 2		
c <sup>2</sup>	67.7	+104	+ 7 2	46 21	116 42		
c <sup>3</sup>	68.1	+111	+ 7 31	47 37	117 58		
c <sup>4</sup>	68.1	+127	+ 8 30	47 59	118 20		
1865 January 2 1 <sup>h</sup> 17 <sup>m</sup>							
a	-49.0	- 28	- 4 50	287 58	25 49	a	
a <sup>1</sup>	47.3	- 41	- 5 38	289 48	27 39		
b	+48.5	+152	+ 7 6	14 44	112 35		
b <sup>1</sup>	49.9	+145	+ 6 43	16 18	114 9		
b <sup>2</sup>	52.9	+166	+ 8 13	20 1	117 52		
b <sup>3</sup>	54.1	+182	+ 9 16	21 41	119 32		
January 8 1 <sup>h</sup> 10 <sup>m</sup>							
a	-41.1	+159	+ 7 3	290 11	112 10		a
b	+38.1	- 85	- 9 26	358 22	180 21		
b <sup>1</sup>	38.1	- 39	- 6 46	358 13	180 12		
b <sup>2</sup>	41.1	-101	-10 20	1 32	183 31		
January 11 0 <sup>h</sup> 14 <sup>m</sup>							
a <sup>1</sup>	- 7.6	- 81	- 8 45	316 1	179 33	a	
a	7.3	- 83	- 8 53	316 18	179 50		
b <sub>1</sub>	+40.1	- 49	- 8 22	357 21	220 53		b
b <sub>2</sub>	40.7	- 53	- 8 37	357 54	221 26		
b <sup>1</sup>	41.4	- 69	- 9 32	358 39	222 11		
b <sup>2</sup>	44.2	- 34	- 7 30	1 28	225 0		
b <sup>3</sup>	46.4	- 79	-10 7	3 58	227 30		b <sup>4</sup>
c	57.2	+287	+11 49	20 11	243 43		
c <sup>1</sup>	57.6	+306	+13 2	21 17	244 49		c <sup>2</sup>
c <sup>2</sup>	58.0	+286	+11 45	21 26	244 58		

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date	
1865 January 12 2 <sup>h</sup> 19 <sup>m</sup>							
a	-24.3	-108''	- 9° 11'	300° 38'	179° 24'	A	
b <sub>s</sub>	+22.4	- 62	- 8 44	340 16	219 2		
b <sub>n</sub>	23.3	- 48					
b <sup>1</sup>	23.0	- 41	- 7 56	340 25	219 11		
b <sup>2</sup>	23.9	- 64	- 9 18	341 7	219 53		
b <sup>3</sup>	26.1	- 74	-10 6	343 4	221 50		
b <sup>4</sup>	29.4	- 44	- 8 17	346 4	224 50		
b <sup>5</sup>	31.6	- 72	- 9 57	348 5	226 51		
b <sup>6</sup>	32.2	- 94	-11 16	348 40	227 26		
b <sup>7</sup>	32.6	- 84	-10 42	348 58	227 44		
c <sup>1</sup>	45.8	+297	+11 38	4 25	243 11	A	
c	46.4	+292	+11 21	4 59	243 45		
c <sup>2</sup>	46.6	+299	+11 47	5 25	244 11		
January 16 0 <sup>h</sup> 3 <sup>m</sup>							
a <sub>1</sub>	-39.8	-151	- 9 32	281 29	215 5	a <sub>1</sub> a <sub>2</sub>	
a <sup>1</sup>	39.4	-139	- 8 54	282 5	215 41		
a <sub>2</sub>	38.9	-148	- 9 29	282 28	216 4		
a <sup>2</sup>	35.3	-125	- 8 36	286 14	219 50		
a <sup>3</sup>	34.1	-145	- 9 54	287 5	220 41		
a <sup>4</sup>	33.6	-137	- 9 30	287 44	221 20		
a <sup>5</sup>	28.0	-138	-10 13	292 48	226 24		
a <sup>6</sup>	26.2	-148					
a <sup>6</sup>	25.8	-144	-10 56	294 43	228 19		
a <sup>6</sup>	25.1	-148					
a <sup>7</sup>	23.4	-151	-11 29	296 47	230 23	B	
b <sup>1</sup>	+39.5	-167	-17 4	352 2	285 38		
b <sup>2</sup>	39.9	-169	-17 11	352 32	286 8		
b	41.9	-181	-17 58	354 44	288 20		
January 18 23 <sup>h</sup> 50 <sup>m</sup>							
a <sub>1</sub>	-59.9	-207	- 8 44	253 2	214 34	a	
a <sub>2</sub>	59.4	-212	- 9 8	253 43	215 15		
b <sub>s</sub>	+ 7.6	-205	-18 13	320 26	281 58		
b <sub>n</sub>		-221					
b <sub>2</sub>	8.2	-218	-18 35	320 56	282 28		
b <sub>1</sub> <sup>1</sup>	9.8	-223	-19 1	322 15	283 47		
b <sub>2</sub> <sup>1</sup>	10.2	-214	-18 31	322 38	284 10		
b <sub>3</sub> <sup>1</sup>	10.6	-214	-18 34	323 2	284 34		
b <sub>1</sub> <sup>2</sup>	12.8	-189	-17 16	325 3	286 35		
b <sup>3</sup>	14.9	-215	-18 59	326 47	288 19		
b <sup>4</sup>	15.3	-191	-17 35	327 13	288 45	A	
b <sup>5</sup>	15.6	-177	-16 46	327 31	289 3		
b <sup>6</sup>	16.0	-195	-17 53	327 49	289 21		
b <sup>7</sup>	17.3	-182	-17 13	329 0	290 32		
b <sup>8</sup>	17.3	-225	-19 46	328 54	290 26		
b <sup>9</sup>	19.0	-214	-19 14	330 27	291 59		
January 20 0 <sup>h</sup> 29 <sup>m</sup>							
a <sub>s</sub>	-23.1	-289''	-18° 35'	292° 8'	282° 7'		a
a <sub>n</sub>	20.1	-260					A
a <sub>1</sub>	20.8	-237	-16 29	293 25	283 24		
a <sup>1</sup>	16.8	-251	-17 52	296 48	286 47		
a <sup>2</sup>	16.5	-287	-20 2	296 32	286 31		
a <sup>3</sup>	14.8	-233	-17 4	298 48	288 47		
a <sup>4</sup>	14.5	-239	-17 27	298 56	288 55		
a <sup>5</sup>	13.4	-260	-18 50	299 37	289 36		
a <sup>6</sup>	13.0	-243	-17 53	300 9	290 8		
a <sup>7</sup>	12.8	-268	-19 23	300 2	290 1		
a <sup>8</sup>	12.3	-243	-17 58	300 48	290 47		
a <sup>9</sup>	11.4	-259	-19 1	301 22	291 21	b?	
a <sup>10</sup>	10.4	-250	-18 37	302 21	292 20		
b <sup>1</sup>	+26.5	- 21	- 8 58	335 35	325 34		
b <sup>2</sup>	28.7	- 30	- 9 40	337 32	327 31		
b <sup>3</sup>	29.0	0	- 7 56	337 48	327 47	b <sup>1</sup>	
b <sup>4</sup>	29.4	+ 2	- 7 51	338 19	328 18		
b	30.4	- 7	- 8 27	339 9	329 8	b <sub>1</sub> b <sub>2</sub>	
c <sup>1</sup>	66.4	+ 60	- 5 15	26 41	16 40		
c	66.8	+ 57	- 5 24	27 50	17 49	e	
January 24 0 <sup>h</sup> 10 <sup>m</sup>							
a <sub>n</sub>	-58.3	-419				a	
a <sub>s</sub>	57.3	-444	-19 14	237 45	283 41	a <sup>1</sup>	
a <sup>1</sup>	54.6	-440	-20 45	243 47	289 43		
a <sup>2</sup>	54.2	-429	-20 17	245 22	291 18		
b <sub>n</sub>		-148				b	
b <sub>s</sub>	37.9	-155	- 8 16	274 32	320 29		
b <sup>1</sup>	34.4	-162	- 9 31	277 47	323 43	b <sup>1</sup>	
b <sub>1</sub> <sup>1</sup>	30.1	-142	- 9 9	282 8	328 4		
b <sub>2</sub> <sup>1</sup>	29.5	-136	- 8 55	282 44	328 40		
c <sup>1</sup>	23.0	+ 78	+ 2 15	290 59	336 55		
c	22.0	+ 84	+ 2 26	291 54	337 50	c	
c <sup>2</sup>	18.0	+132	+ 4 35	295 46	341 42	c <sup>1</sup>	
c <sup>3</sup>	16.8	+123	+ 3 53	296 40	342 36		
c <sup>4</sup>	15.8	+104	+ 2 37	297 19	343 15	c <sup>5</sup>	
d <sub>1</sub> <sup>1</sup>	19.8	-178	-13 35	294 14	340 10		
d <sub>2</sub> <sup>1</sup>	19.7	-185	-14 1	294 14	340 10	d <sup>2</sup>	
d	13.7	-185	-14 18	295 52	341 48		
d <sup>2</sup>	9.7	-205	-16 6	299 3	345 0	d	
d <sup>3</sup>	7.2	-215	-17 3	301 4	347 0		
e	+25.6	+ 30	- 6 56	330 8	16 5	e	
f <sub>1</sub>	31.0	-171	-19 12	335 12	21 8	f	
f <sub>2</sub>	31.4	-178	-19 39	335 34	21 30		
f <sup>1</sup>	38.6	-211	-22 17	343 6	29 2		
g	54.8	+157	- 1 38	3 3	49 0	g	

Letter	$\Delta a$	$\Delta \delta$	b	$\Delta$	$L'$	Letter on next date
1865 January 25 2 <sup>h</sup> 28 <sup>m</sup>						
a	-60 <sup>s</sup> .7	-445''	-19° 19'	224° 43'	286° 2'	
a <sup>n</sup>	58.8	-439	-19 8	232 9	293 28	
a <sup>s</sup>		-454				
b <sup>n</sup>	50.8	-206	- 8 33	258 1	319 20	a <sup>1</sup>
b <sup>s</sup>		-213				
b <sup>1</sup>	43.5	-190	- 8 43	266 59	328 18	a <sub>1</sub> a <sub>2</sub>
b <sup>n</sup>		-177				
c	38.9	+ 19	+ 1 56	274 47	336 6	B
c <sup>1</sup>	37.6	+ 31	+ 2 17	276 10	337 29	
c <sup>2</sup>	33.1	+ 33	+ 1 32	280 27	341 46	
c <sup>3</sup>	32.6	+ 79	+ 4 6	281 21	342 40	
c <sup>4</sup>	32.6	+ 63	+ 3 10	281 13	342 32	
c <sup>5</sup>	31.5	+ 61	+ 2 51	282 12	343 31	c
d <sup>1</sup>	34.5	-236	-13 32	275 4	336 23	
d <sup>2</sup>	29.9	-229	-13 59	279 32	340 51	c <sup>2</sup>
d	28.2	-234	-14 35	281 2	342 21	
e	+ 6.0	- 8	- 6 59	313 2	14 21	d
f	15.3	-195	-19 4	319 21	20 40	
f <sup>1</sup>	16.1	-199	-19 25	320 5	21 24	e
g	42.7	+145	- 2 5	347 30	48 49	
January 27 2 <sup>h</sup> 39 <sup>m</sup>						
a <sup>1</sup>	-63.6	-281	- 7 50	230 16	319 46	
a <sub>1</sub>	60.6	-265	- 8 11	238 41	328 11	
a <sub>2</sub>	60.1	-260	- 8 4	239 50	329 20	
b	59.4	- 74	+ 1 56	246 43	336 13	
b <sup>1</sup>	58.0	- 51	+ 2 48	249 21	338 51	
b <sup>2</sup>	55.8	- 44	+ 2 36	252 34	342 4	
b <sup>3</sup>	55.2	- 28	+ 3 21	253 38	343 8	
c	53.9	-313	-12 51	248 3	337 33	
c <sup>1</sup>	50.5	-309	-13 34	252 58	342 28	
c <sup>2</sup>	49.8	-321	-14 25	253 27	342 57	
d	14.6	-254	-18 3	290 33	20 3	
e	+13.8	+113	- 1 25	318 57	48 27	a
	14.4					
e <sup>1</sup>	21.4	+102	- 3 0	325 5	54 35	
February 2 22 <sup>h</sup> 9 <sup>m</sup>						
a	-60.2	-169	- 0 54	236 14	47 18	
February 12 1 <sup>h</sup> 45 <sup>m</sup>						
a	-35.8	-230	- 9 31	254 2	207 32	a
b <sup>s</sup>	33.5	+212	+14 52	265 19	218 49	b
b <sup>n</sup>	32.4	+232				
b <sup>1</sup>	31.1	+228	+14 39	267 7	220 37	b <sup>1</sup>
b <sup>2</sup>	29.6	+223	+13 54	268 28	221 58	
b <sup>3</sup>	28.0	+235	+14 6	270 9	223 39	b <sup>2</sup>
February 13 2 <sup>h</sup> 17 <sup>m</sup>						
b <sup>4</sup>	-26 <sup>s</sup> .9	+269''	+15° 49'	271° 33'	225° 3'	
b <sup>5</sup>	24.4	+248	+13 49	273 33	227 3	b <sup>3</sup>
c	+40.8	+381	+ 6 25	334 11	287 41	c
c <sup>1</sup>	40.8	+428	+ 9 15	335 48	289 18	c <sup>1</sup>
c <sup>2</sup>	43.3	+395	+ 6 53	337 37	291 7	c <sup>2</sup>
c <sup>3</sup>	45.9	+430	+ 8 40	342 8	295 38	c <sup>3</sup>
c <sup>4</sup>	47.4	+401	+ 6 42	343 4	296 34	c <sup>4</sup>
d <sup>s</sup>	44.3	- 94	-21 25	331 7	284 38	d
d <sup>n</sup>	45.5	- 80				
d <sup>1</sup>	45.5	- 67	-20 20	331 58	285 28	d <sup>1</sup>
February 13 2 <sup>h</sup> 17 <sup>m</sup>						
a	-46.1	-312	-10 21	239 7	206 58	b
b <sup>n</sup>	45.3	+154	+14 19	250 54	218 45	a
b <sup>s</sup>	44.4	+133				
b <sup>1</sup>	43.1	+154	+14 18	252 59	220 50	a <sup>2</sup>
b <sup>2</sup>	40.6	+156	+13 33	255 43	223 34	
b <sup>3</sup>	37.9	+166	+13 14	258 39	226 30	
c	+27.9	+333	+ 5 45	318 51	286 42	c
c <sup>1</sup>	29.0	+381	+ 8 21	321 5	288 56	
c <sup>2</sup>	30.8	+349	+ 6 7	322 0	289 51	
c <sup>3</sup>	34.7	+401	+ 8 29	327 18	295 9	
c <sup>4</sup>	36.3	+358	+ 5 39	327 42	295 33	c <sup>2</sup>
c <sup>5</sup>	36.8	+367	+ 6 5	328 31	296 22	c <sup>3</sup>
d <sup>n</sup>	32.8	-120	-21 55	316 49	284 40	d
d <sup>s</sup>	33.8	-140				
d <sup>1</sup>	34.3	-110	-20 57	318 4	285 55	d <sup>2</sup>
d <sup>2</sup>	34.3	- 78	-19 6	318 21	286 12	
February 15 0 <sup>h</sup> 30 <sup>m</sup>						
a <sup>n</sup>	-60.6	+ 51	+15 24	225 55	220 48	
a <sup>s</sup>		+ 32				
a <sup>1</sup>	59.6	+ 58	+15 51	228 5	222 58	
a <sup>2</sup>	59.5	+ 40	+14 46	228 7	223 0	
b	57.3	-406	- 9 41	214 31	209 24	
c <sup>1</sup>	6.2	+268	+ 9 52	287 42	282 35	a <sup>2</sup>
c	+ 0.0	+241	+ 6 39	292 15	287 8	
c <sup>2</sup>	11.2	+268	+ 5 24	302 0	296 53	a
c <sup>3</sup>	12.3	+282	+ 5 55	303 15	298 8	
d <sup>1</sup>	6.8	-163	-17 49	290 41	285 34	b <sup>1</sup>
d <sup>n</sup>	7.8	-198	-20 44	291 14	286 7	b <sub>1</sub>
d <sup>s</sup>	8.9	-216				
d <sup>2</sup>	9.6	-191	-20 8	292 37	287 30	b <sub>2</sub>
d <sup>3</sup>	10.4	-177	-19 32	293 34	288 27	
d <sup>4</sup>	12.1	-179	-20 6	295 2	289 55	b <sup>2</sup>
February 17 0 <sup>h</sup> 37 <sup>m</sup>						
a <sup>1</sup>	-37.9	+ 71	+ 8 29	253 27	276 28	a <sup>1</sup>
a <sup>2</sup>	34.2	+ 99	+ 8 47	257 35	280 36	



## 1865 February 17—Continued

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$a^3$	-31.9	+110"	+ 8° 39'	259° 54'	282° 55'	a
a	28.6	+ 94	+ 6 40	262 39	285 40	
$b^1$	19.9	-298	-17 37	261 27	284 28	
$b_1^{\text{n}}$	18.6	-328				
$b_1^{\text{s}}$	17.8	-339	-20 8	261 55	284 56	$b_1$
$b_2$	17.4	-321	-19 42	263 1	286 2	$b_2$
$b_3$	17.4	-346	-21 6	262 15	285 16	
$b^2$	14.7	-335	-21 19	264 57	287 58	
$b^3$	14.7	-360	-22 44	264 12	287 13	

February 18 2<sup>h</sup> 14<sup>m</sup>

$a^1$	-50.2	- 9	+ 8 51	237 19	275 19	a
a	41.7	+ 16	+ 6 58	247 32	285 32	
$b_1^{\text{n}}$	30.3	-394	-19 22	247 14	285 14	$b_1$
$b_1^{\text{s}}$		-400				
$b_2$	29.2	-404	-20 8	248 2	286 2	$b_2$
$b^1$	28.3	-396	-20 1	249 14	287 14	

February 21 23<sup>h</sup> 47<sup>m</sup>

a	-63.0	-188	+ 6 23	205 29	284 9	a
$b_1$	49.6	-571	-19 25	207 30	286 10	
$b_2$	49.2	-579	-20 0	207 24	286 4	
c	41.2	- 2	+ 6 19	244 46	323 26	
$c^1$	37.3	+ 23	+ 6 14	249 13	327 53	$a^1$
d	14.0	-186	-13 2	265 14	343 54	
$d^1$	11.3	-167	-12 51	267 56	346 36	
$d^2$	10.1	-181	-14 0	268 39	347 19	
e	+39.2	+438	+ 7 51	326 31	45 11	$a^1$
f	39.3	+216	- 5 6	320 17	38 57	
$f^1$	39.5	+207	- 5 40	320 18	38 58	

February 24 0<sup>h</sup> 19<sup>m</sup>

a	-46.5	-430	-13 22	220 53	341 58	a
$a^1$	44.4	-437	-14 42	223 21	344 26	

February 25 1<sup>h</sup> 54<sup>m</sup>

a	-51.5	-490	-13 31	207 14	343 16	A
b	20.6	-117	- 6 47	257 2	33 4	
$b^1$	16.1	-126	- 8 50	260 39	36 41	

February 27 23<sup>h</sup> 42<sup>m</sup>

$a^1$	-43.6	-282	- 7 5	228 7	30 56	
a	41.3	-280	- 7 19	230 44	33 33	
$a^2$	39.9	-276	- 7 42	232 23	35 12	

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$b^1$	-27.0	+142"	+ 9° 47'	255° 17'	58° 6'	
$b^2$	27.0	+155	+10 31	255 32	58 21	
$b^3$	26.3	+158	+10 26	256 14	59 3	
$b^4$	25.8	+146	+ 9 34	256 27	59 16	
$b^5$	23.4	+151	+ 8 52	258 32	61 21	
$b^6$	22.5	+198	+11 17	260 22	63 11	
$b^7$	22.5	+163	+ 9 19	259 39	62 28	
$b^{\text{n}}$		+190				
$b^{\text{s}}$	21.8	+178	+10 15	260 41	63 30	
c	+43.8	+421	+ 4 35	326 5	128 54	

March 5 0<sup>h</sup> 57<sup>m</sup>

$a^{\text{s}}$	-7.5	+181				b
$a^{\text{n}}$	5.5	+188	+ 5 1	267 40	155 25	
$a^1$	7.0	+218	+ 7 4	268 0	155 45	$b_3$
$a^2$	3.2	+174	+ 3 18	270 4	157 49	
$a^3$	2.3	+227	+ 5 55	272 1	159 46	
$a^4$	1.6	+197	+ 4 2	271 53	159 38	
$a^5$	0.9	+225	+ 5 20	273 6	160 51	$b^4$
$a^6$	0.6	+233	+ 5 44	273 35	161 20	
b	2.5	-202	-17 19	261 42	149 27	$c^1$
$c^1$	+18.3	+466	+12 54	295 45	183 30	
$c^2$	19.4	+487	+13 48	297 27	185 12	
c	19.9	+464	+12 17	297 7	184 52	
$c^3$	22.6	+518	+14 44	301 31	189 16	$c^4?$
$c^4$	23.2	+489	+12 47	301 2	188 47	
$c^5$	23.6	+511	+14 0	302 15	190 0	

March 6 1<sup>h</sup> 49<sup>m</sup>

a	-48.7	-139	+ 4 32	219 30	121 48	a
$b^{\text{n}}$	21.4	+ 99				
$b^{\text{s}}$	19.5	+ 83	+ 5 3	253 1	155 19	
$b^1$	16.4	+125	+ 5 22	257 14	159 32	
$b^2$	15.9	+171	+ 7 42	258 41	160 59	B
$b^3$	15.2	+127	+ 5 2	258 16	160 34	
$b^4$	14.9	+139	+ 5 34	258 47	161 5	
$c^1$	+ 5.3	+393	+12 45	281 27	183 45	
c	7.5	+380	+11 15	282 55	185 13	
$c^2$	8.3	+425	+13 37	284 53	187 11	
$c^3$	9.2	+395	+11 34	284 46	187 4	
$c^4$	10.9	+450	+14 14	288 50	191 8	

March 10 0<sup>h</sup> 24<sup>m</sup>

$a^{\text{n}}$	-57.3	-220	+ 5 22	199 7	156 43	a
$a^{\text{s}}$		-229				
$a^1$	56.7	-231	+ 4 44	199 54	157 30	
b	44.7	+ 41	+12 57	224 51	182 27	
$b^1$	44.0	+ 25	+11 44	225 18	182 54	

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1865 March 10—Continued						
$b^2$	-43.6	+ 48"	+ 12° 49'	226° 15'	183° 51'	
$c$	+46.5	+376	- 0 37	317 48	275 24	$b^1$
$c^1$	48.6	+388	- 0 21	321 20	278 56	$b$
$c^2$	50.5	+374	- 1 32	323 43	281 19	
$d$	58.4	+ 99	-18 51	329 23	286 59	$c$
$e$	59.1	+303	- 6 47	338 18	295 54	$d$
$e^1$	60.4	+302	- 6 44	342 55	300 31	$d^1?d^2$
March 11 0 <sup>h</sup> 24 <sup>m</sup>						
$a$	-60.6	-269	+ 6 30	181 27	153 5	
$b^1$	+35.7	+341	- 0 2	302 46	274 24	$b^1$
$b$	38.9	+361	+ 0 15	306 53	278 31	$b$
$c$	51.1	+ 82	-18 37	315 11	286 49	$c$
$d$	52.1	+305	- 6 2	322 35	294 13	$d^1$
$d^1$	55.3	+305	- 6 33	328 24	300 2	$d^4$
$d^2$	55.9	+303	- 6 44	329 33	301 11	$d$
March 12 1 <sup>h</sup> 23 <sup>m</sup>						
$a^1$	+15.1	+ 31	-10 48	274 50	261 5	
$a$	18.3	+ 29	-11 59	277 33	263 48	
$a^2$	19.9	+ 29	-12 31	278 55	265 10	
$b^1$	22.4	+272	+ 0 0	287 1	273 16	
$b$	26.4	+298	+ 0 11	291 21	277 36	$a$
$b^2$	26.4	+328	+ 1 52	292 13	278 28	$a^1$
$c$	41.9	+ 40	-18 45	301 17	287 32	$c$
$d^1$	42.5	+272	- 5 52	307 15	293 30	$b^1$
$d^2$	45.3	+279	- 6 10	310 54	297 9	$b$
$d^3$	46.6	+294	- 5 38	313 1	299 16	$b^2$
$d^4$	47.7	+281	- 6 37	314 3	300 18	
$d$	48.7	+274	- 7 14	315 13	301 28	$b^3$
$d^5$	52.5	+283	- 7 32	321 26	307 41	$b^4$
$e$	48.6	+404	+ 0 18	320 11	306 26	$d$
$e^1$	51.4	+418	+ 0 39	325 39	311 54	$d^2$
March 14 0 <sup>h</sup> 38 <sup>m</sup>						
$a$	+ 0.0	+135	+ 0 12	262 57	276 50	$a^1$
$a^1$	0.1	+164	+ 1 45	263 45	277 38	
$a^2$	0.7	+135	- 0 3	263 31	277 24	$a$
$b^1$	18.4	+124	- 6 50	277 51	291 44	$b^2$
$b$	23.1	+146	- 7 10	282 28	296 21	
$b^2$	23.8	+192	- 4 54	284 15	298 8	
$b^3$	27.3	+155	- 8 2	286 31	300 24	$b^5b^6$
$b^4$	31.5	+187	- 7 35	291 17	305 10	$b^7?b^8$
$c$	19.2	-100	-19 22	273 29	287 22	
$d$	28.0	+305	+ 0 1	291 8	305 1	$c$
$d^1$	29.9	+325	+ 0 33	293 33	307 26	
$d^2$	33.4	+328	- 0 18	297 2	310 55	
Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1865 March 16 2 <sup>h</sup> 21 <sup>m</sup>						
$a^1$	-28.5	- 71"	+ 0° 27'	232° 9'	275° 6'	$a$
$a$	27.2	- 66	+ 0 10	233 26	276 23	$a^2$
$b^1$	9.7	- 11	- 3 59	249 28	292 25	
$b^2$	8.9	- 53	- 6 32	249 4	292 1	
$b^3$	8.9	- 32	- 5 26	249 37	292 34	$b^1$
$b^4$	7.0	- 32	- 6 9	251 6	294 3	$b^2$
$b$	2.6	- 50	- 8 47	254 14	297 11	$b^3$
$b^5$	0.7	- 9	- 7 19	256 48	299 45	$b$
$b^6$	+ 0.1	- 10	- 6 39	257 43	300 40	
$b^7$	3.1	+ 13	- 7 32	260 20	303 17	$b^5$
$b^8$	7.4	+ 34	- 7 59	264 24	307 21	
$c$	1.1	+144	+ 0 14	262 1	304 58	
$d$	1.9	+248	+ 5 38	265 15	308 12	$c$
$d^1$	3.1	+249	+ 5 14	266 15	309 12	$c^2$
$d^2$	3.9	+276	+ 6 25	267 38	310 35	$c^3?c^4$
$d^3$	6.5	+293	+ 6 26	270 13	313 10	$c^6$
$e$	28.1	+513	+11 43	296 30	339 27	
March 17 0 <sup>h</sup> 39 <sup>m</sup>						
$a^1$	-39.4	-166	+ 0 25	218 7	274 6	} $A?$
$a$	38.8	-153	+ 0 49	219 8	275 7	
$a^2$	37.7	-150	+ 0 28	220 21	276 20	
$b^1$	21.7	-121	- 4 54	235 43	291 42	
$b^2$	20.8	-119	- 5 10	236 32	292 31	
$b^3$	15.9	-139	- 8 14	240 5	296 4	
$b$	12.9	-107	- 7 46	243 27	299 26	
$b^4$	12.3	-135	- 9 27	243 8	299 7	
$b^5$	7.8	- 67	- 7 39	248 40	304 39	
$c^1$	13.8	+143	+ 5 55	249 7	305 6	$b^1$
$c$	12.4	+146	+ 5 31	250 20	306 19	$b$
$c^2$	11.7	+144	+ 5 7	250 53	306 52	
$c^3$	9.5	+175	+ 5 57	253 24	309 23	
$c^4$	8.8	+168	+ 5 19	253 47	309 46	
$c^5$	6.8	+ 95	+ 0 36	253 34	309 33	
$c^6$	5.1	+215	+ 6 27	257 56	313 55	$b^2$
$d$	+49.5	+446	+ 2 1	319 14	15 13	
March 19 0 <sup>h</sup> 58 <sup>m</sup>						
$a$	-51.8	-282	+ 0 54	196 42	280 56	
$a^1$	50.9	-276	+ 0 44	198 14	282 28	
$a^2$	49.8	-256	+ 1 9	200 40	284 54	$a$
$b^1$	38.7	- 64	+ 5 36	219 49	304 3	
$b$	37.7	- 53	+ 5 44	221 7	305 21	$bb^1$
$b^2$	32.9	+ 9	+ 6 51	227 23	311 37	$b^2$
$c$	3.6	+242	+ 7 25	257 53	342 7	

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1865 March 21 0 <sup>h</sup> 10 <sup>m</sup>						
a	-58.1	-379''	+ 0° 40'	174° 9'	285° 59'	a
b	55.1	-205	+ 6 48	192 43	304 33	
b <sup>1</sup>	54.4	-231	+ 5 7	192 46	304 36	
b <sup>2</sup>	52.9	-189	+ 6 22	196 56	308 46	
c <sup>1</sup>	+ 7.0	+233	+ 2 59	264 16	16 6	
c <sup>2</sup>	15.7	+306	+ 3 52	273 28	25 18	
c	16.0	+315	+ 4 15	273 59	25 49	
March 23 2 <sup>h</sup> 2 <sup>m</sup>						
a	-11.5	+110	+ 3 32	244 13	25 13	a
b <sup>1</sup>	+47.5	+406	- 0 24	308 2	89 2	
b <sup>2</sup>	48.3	+438	+ 1 18	311 1	92 1	
b	49.5	+433	+ 0 44	312 44	93 44	
March 27 2 <sup>h</sup> 5 <sup>m</sup>						
a <sup>n</sup>	+30.8	+542	+11 39	290 20	127 30	a
a <sup>1</sup>	32.8	+527	+12 37	293 13	130 23	a <sup>2</sup>
a <sup>2</sup>	33.4	+535	+10 58	292 40	129 50	a <sup>5</sup>
a <sup>3</sup>	34.6	+553	+11 41	294 59	132 9	a <sup>6</sup>
a <sup>4</sup>	35.5	+560	+11 50	296 25	133 35	a <sup>7</sup>
a <sup>5</sup>	36.4	+537	+10 11	296 9	133 19	a <sup>8</sup>
a <sup>6</sup>	36.7	+549	+10 49	297 10	134 20	a <sup>9</sup>
a <sup>7</sup>	37.2	+544	+10 22	297 34	134 44	
a <sup>8</sup>	37.8	+511	+ 7 57	296 34	133 44	
March 28 2 <sup>h</sup> 49 <sup>m</sup>						
a <sup>1</sup>	+19.1	+525	+15 14	277 3	128 41	a
a <sup>s</sup>	19.3	+463	+11 42	275 27	127 5	
a <sup>n</sup>	20.2	+474	+12 42	278 32	130 10	
a <sup>2</sup>	21.9	+499	+11 32	278 39	130 17	
a <sup>3</sup>	22.7	+484	+11 5	278 53	130 31	a <sup>3</sup>
a <sup>4</sup>	23.1	+479	+11 41	280 39	132 17	
a <sup>5</sup>	24.3	+496	+10 27	281 37	133 15	
a <sup>6</sup>	25.8	+484	+10 56	282 19	133 57	
a <sup>7</sup>	26.1	+494	+10 37	282 46	134 24	a <sup>5</sup>
a <sup>8</sup>	26.7	+492	+ 8 19	281 31	133 9	
a <sup>9</sup>	27.0	+454				
April 1 1 <sup>h</sup> 54 <sup>m</sup>						
a <sup>s</sup>	-30.1	+106	+12 6	220 17	127 31	a
a <sup>n</sup>	29.1	+124	+ 9 49	221 32	128 46	a <sup>1</sup>
a <sup>1</sup>	27.5	+ 90	+10 8	222 20	129 34	a <sup>2</sup>
a <sup>2</sup>	26.9	+101	+11 24	224 45	131 59	a <sup>4</sup>
a <sup>3</sup>	25.2	+138	+11 20	227 0	134 14	
a <sup>4</sup>	23.1	+154	+ 8 3	225 54	133 8	
a <sup>5</sup>	22.7	+ 97				
April 2 2 <sup>h</sup> 5 <sup>m</sup>						
a <sup>s</sup>	-40.6	+ 12''	+12° 2'	206° 47'	128° 9'	a
a <sup>n</sup>	39.8	+ 32	+ 9 46	208 18	129 40	
a <sup>1</sup>	38.1	- 2	+11 11	211 16	132 38	
a <sup>2</sup>	36.2	+ 41	+11 29	213 4	134 26	
a <sup>3</sup>	34.8	+ 60				
April 9 0 <sup>h</sup> 6 <sup>m</sup>						
a	-46.1	- 20	+12 58	192 26	210 53	a
a <sup>1</sup>	42.4	+ 25	+13 34	197 49	216 16	
a <sup>2</sup>	41.5	+ 23	+13 3	198 40	217 7	
April 13 0 <sup>h</sup> 17 <sup>m</sup>						
a	-49.0	-531	-11 13	160 22	234 58	a
a <sup>1</sup>	47.7	-523	-11 35	163 38	238 14	
b	+16.8	+428	+11 28	255 56	330 32	
April 17 0 <sup>h</sup> 35 <sup>m</sup>						
a	-23.1	-330	-13 21	197 14	328 14	a
a <sup>1</sup>	20.9	-274	-11 21	201 8	332 8	b
b	+ 2.1	+362	+13 46	237 26	8 26	
c <sup>1</sup>	18.7	+349	+ 6 47	250 43	21 43	
c <sup>2</sup>	19.0	+342	+ 6 17	250 46	21 46	
c <sup>3</sup>	25.2	+382	+ 6 21	257 29	28 29	c <sup>1</sup>
c <sup>4</sup>	29.4	+414	+ 6 38	262 34	33 34	c <sup>2</sup>
c <sup>5</sup>	30.3	+447	+ 8 44	263 27	34 27	c <sup>3</sup>
c <sup>6</sup>	32.1	+456	+ 8 11	266 57	37 57	
c <sup>7</sup>	32.6	+434	+ 6 48	266 37	37 37	
c <sup>8</sup>	33.2	+459	+ 7 59	268 12	39 12	
c	33.2	+444	+ 7 7	267 34	38 34	
April 19 1 <sup>h</sup> 44 <sup>m</sup>						
a	-42.1	-497	-13 38	168 19	328 3	a
b	8.4	+152	+ 6 21	221 27	21 11	
c <sup>1</sup>	+ 0.6	+212	+ 6 8	230 9	29 53	
c <sup>2</sup>	5.0	+282	+ 8 21	235 32	35 16	
c	7.3	+300	+ 8 28	237 56	37 40	a
c <sup>3</sup>	7.9	+280	+ 7 9	237 51	37 35	
c <sup>4</sup>	8.5	+328	+ 9 35	239 44	39 28	
c <sup>5</sup>	8.5	+287	+ 7 18	238 32	38 16	
April 24 22 <sup>h</sup> 49 <sup>m</sup>						
a	+29.7	+460	+10 17	257 44	125 56	a
April 26 0 <sup>h</sup> 37 <sup>m</sup>						
a	+ 4.5	+312	+11 5	228 52	126 12	a
a <sup>1</sup>	5.8	+293	+ 9 31	229 25	126 45	



Letter	<i>Δa</i>	<i>Δδ</i>	b	L	L'	Letter on next date
1865 April 26—Continued						
<i>b</i>	+15.2	- 55"	-12° 52'	228° 5'	125° 25'	
<i>c</i>	20.0	+413	+11 15	244 56	142 16	<i>c</i>
April 27 2 <sup>h</sup> 33 <sup>m</sup>						
<i>a</i>	-10.3	+197	+10 16	212 59	125 28	<i>A</i>
<i>b</i>	+ 5.0	-176	-15 41	215 28	127 57	
<i>c</i>	8.6	+331	+10 49	231 38	144 7	
April 30 2 <sup>h</sup> 35 <sup>m</sup>						
<i>a</i> <sup>1</sup>	-38.1	-429	-12 35	166 47	121 24	<i>a</i>
<i>a</i> <sup>2</sup>	36.9	-431	-13 10	167 56	122 33	
<i>a</i>	36.2	-422	-13 0	169 8	123 45	
<i>b</i>	35.7	+ 14	+10 9	183 43	138 20	<i>c</i>
<i>c</i> <sup>1</sup>	+57.6	+218	-10 27	277 35	232 12	
<i>c</i>	58.1	+163	-13 45	276 54	231 31	
<i>c</i> <sup>2</sup>	58.9	+191	-12 19	279 24	234 1	<i>c</i> <sup>3</sup>
<i>c</i> <sup>3</sup>	59.8	+236	- 9 54	283 7	237 44	
<i>c</i> <sup>4</sup>	60.4	+175	-13 34	282 6	236 43	
May 2 0 <sup>h</sup> 45 <sup>m</sup>						
<i>a</i>	-53.8	-118	+10 17	157 54	139 30	<i>a</i> <sup>1</sup>
<i>b</i> <sup>1</sup>	+21.4	+412	+11 49	240 0	221 36	
<i>b</i> <sup>2</sup>	22.4	+401	+10 51	240 31	222 7	
<i>b</i> <sup>3</sup>	24.9	+415	+10 51	243 12	224 48	<i>a</i>
<i>b</i>	25.6	+417	+10 43	243 57	225 33	
<i>c</i> <sup>1</sup>	41.2	+ 72	-13 34	249 19	230 55	
<i>c</i>	41.6	+ 79	-13 18	249 54	231 30	<i>b</i>
<i>c</i> <sup>2</sup>	41.9	+111	-11 37	250 56	232 32	
<i>c</i> <sup>3</sup>	45.3	+163	- 9 43	256 2	237 38	
<i>c</i> <sup>4</sup>	46.1	+ 99	-13 37	255 30	237 6	<i>b</i> <sup>3</sup>
May 3 2 <sup>h</sup> 44 <sup>m</sup>						
<i>a</i> <sup>1</sup>	+ 6.8	+323	+11 54	223 51	220 40	<i>a</i>
<i>a</i> <sup>2</sup>	7.6	+312	+10 59	224 14	221 2	
<i>a</i>	11.4	+328	+10 46	227 45	224 34	
<i>a</i> <sup>3</sup>	13.7	+293	+ 7 50	228 37	225 26	<i>a</i> <sup>4</sup>
<i>a</i> <sup>4</sup>	15.6	+326	+ 9 3	231 11	228 0	
<i>b</i> <sup>1</sup>	27.4	+ 30	-11 16	233 42	230 30	
<i>b</i>	28.9	+ 7	-13 2	234 35	231 24	<i>b</i>
<i>b</i> <sup>2</sup>	32.0	+ 30	-12 45	237 57	234 46	
<i>b</i> <sup>3</sup>	33.9	+ 85	-10 18	241 0	237 48	
May 5 2 <sup>h</sup> 47 <sup>m</sup>						
<i>a</i>	-22.4	+124	+11 14	193 14	218 8	<i>a</i>
<i>a</i> <sup>1</sup>	21.1	+124	+10 45	194 20	219 14	
1865 May 12 23 <sup>h</sup> 26 <sup>m</sup>						
<i>a</i> <sup>1</sup>	-28.4	-139	- 1 12	175 20	296 31	<i>a</i>
<i>a</i>	27.6	-189	- 4 13	174 44	295 55	
<i>a</i> <sup>2</sup>	26.1	-172	- 3 47	176 30	297 41	
<i>a</i> <sup>3</sup>	24.2	-197	- 5 48	177 28	298 39	<i>a</i> <sup>4</sup>
<i>a</i> <sup>4</sup>	21.9	-188	- 6 4	179 40	300 51	
<i>b</i> <sup>1</sup>	4.2	+204	+10 3	203 2	324 13	
<i>b</i>	1.5	+231	+10 41	205 52	327 3	<i>b</i> <sup>2</sup>
<i>b</i> <sup>2</sup>	+ 1.8	+267	+11 43	209 20	330 31	
May 13 0 <sup>h</sup> 46 <sup>m</sup>						
<i>a</i>	-40.2	-278	- 4 56	159 11	295 11	<i>a</i>
<i>a</i> <sup>1</sup>	39.7	-278	- 5 6	159 42	295 42	
<i>a</i> <sup>2</sup>	38.6	-296	- 6 28	160 13	296 13	

<i>a</i> <sup>2</sup>	-18.3	+159"	+11° 43'	197° 27'	222° 21'	
<i>a</i> <sup>3</sup>	16.8	+152	+10 47	198 33	223 27	
<i>a</i> <sup>4</sup>	15.5	+113	+8 7	198 46	223 40	
<i>a</i> <sup>5</sup>	14.5	+127	+8 33	199 52	224 46	
<i>a</i> <sup>6</sup>	12.8	+147	+9 4	201 42	226 36	
<i>a</i> <sup>7</sup>	12.1	+170	+10 7	202 48	227 42	
<i>a</i> <sup>8</sup>	11.8	+150	+8 53	202 35	227 29	
<i>b</i> <sup>1</sup>	+1.0	-136	-11 14	205 49	230 43	<i>B</i>
<i>b</i>	2.2	-163	-13 11	206 12	231 6	
<i>b</i> <sup>2</sup>	6.1	-71	-9 26	211 35	236 29	
<i>c</i> <sup>1</sup>	50.8	+253	-5 28	262 17	287 12	
<i>c</i> <sup>2</sup>	52.4	+248	-6 12	264 30	289 24	<i>c</i> <sup>3</sup>
<i>c</i>	52.9	+235	-7 4	264 50	289 44	<i>c</i> <sup>4</sup>
<i>c</i> <sup>3</sup>	54.1	+216	-8 28	266 2	290 56	<i>c</i> <sup>5</sup>
<i>c</i> <sup>4</sup>	54.5	+209	-8 59	266 27	291 21	
<i>d</i>	59.7	+258	-7 24	278 6	303 0	<i>d</i>

May 7 2 <sup>h</sup> 24 <sup>m</sup>						
<i>a</i>	-47.6	-37	+11 38	163 14	215 59	<i>A</i>
<i>b</i>	26.4	-309	-11 3	176 37	229 22	
<i>b</i> <sup>1</sup>	22.4	-307	-12 23	180 12	232 57	
<i>b</i> <sup>2</sup>	19.1	-304	-13 40	183 14	235 59	<i>A</i>
<i>c</i> <sup>1</sup>	+27.5	+90	-7 10	231 13	283 58	
<i>c</i>	28.6	+108	-6 31	232 40	285 25	
<i>c</i> <sup>2</sup>	29.8	+108	-6 40	233 5	285 50	<i>A</i>
<i>c</i> <sup>3</sup>	32.1	+136	-6 2	236 32	289 17	
<i>c</i> <sup>4</sup>	33.0	+124	-6 58	237 3	289 48	
<i>c</i> <sup>5</sup>	34.6	+103	-8 38	238 6	290 51	<i>A</i>
<i>d</i>	41.7	+174	-7 33	247 5	299 50	
<i>d</i> <sup>1</sup>	46.8	+179	-8 0	252 56	305 41	
<i>e</i> <sup>1</sup>	51.1	+520	+10 32	275 25	328 10	<i>B</i>
<i>e</i> <sup>2</sup>	51.1	+502	+9 25	273 46	326 31	
<i>e</i> <sup>3</sup>	51.6	+493	+8 46	273 59	326 44	
<i>e</i>	53.1	+518	+9 59	279 54	332 39	

## 1865 May 13—Continued

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$a^3$	-36.5	-280"	- 6° 18'	162° 52'	298° 52'	
$a^4$	36.0	-264	- 5 35	163 52	299 52	
$a^5$	35.3	-274	- 6 23	164 13	300 13	$a^2?$
$b$	29.1	- 60	+ 3 21	175 40	311 40	$b$
$b^1$	28.6	- 32	+ 4 45	176 44	312 44	
$b^2$	27.2	- 51	+ 2 55	177 25	313 25	$b^1$
$c$	+ 3.4	+346	+16 0	211 33	347 33	$c^2$
$c^1$	4.9	+361	+16 24	213 12	349 12	$c^3$

May 15 0<sup>h</sup> 37<sup>m</sup>

$a$	-56.5	-379	- 5 0	130 36	294 34	
$a^1$	54.2	-366	- 5 9	135 46	299 44	
$a^2$	53.5	-388	- 6 35	135 40	299 38	
$b$	52.8	-185	+ 4 14	145 33	309 31	
$b^1$	50.3	-185	+ 3 22	148 47	312 45	
$c^1$	26.1	+187	+16 26	181 12	345 10	
$c$	24.7	+189	+16 5	182 29	346 27	A
$c^2$	23.2	+194	+15 51	183 57	347 55	
$c^3$	21.8	+200	+16 8	185 13	349 11	

May 17 0<sup>h</sup> 42<sup>m</sup>

$a$	-48.0	+ 30	+14 27	154 27	346 31	
$a^1$	46.7	+ 7	+12 41	155 36	347 41	
$a^2$	46.4	+ 53	+15 15	156 41	348 46	
$a^3$	44.9	+ 40	+13 58	158 14	350 19	

May 21 0<sup>h</sup> 44<sup>m</sup>

$a$	-62.2	-194	+ 5 36	123 27	11 42	
$a^1$	61.2	-204	+ 4 42	125 21	13 36	
$a^2$	60.7	-201	+ 4 41	126 33	14 48	
$a^3$	58.5	-190	+ 4 35	131 15	19 30	
$a^4$	58.5	-204	+ 3 47	130 46	19 1	

May 23 23<sup>h</sup> 47<sup>m</sup>

$a$	-55.2	-126	+ 6 42	136 34	52 19	
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May 25 0<sup>h</sup> 21<sup>m</sup>

$a$	+59.8	+403	+ 7 29	266 22	210 31	$a$
$b$	65.8	+114	-10 43	266 18	210 27	$b_1$
$b^1$	67.1	+ 93	-12 9	271 50	215 59	$b^1$

May 26 0<sup>h</sup> 33<sup>m</sup>

$a$	+55.3	+386	+ 7 50	252 56	211 14	$a$
$a^1$	55.9	+395	+ 8 13	254 44	213 2	$a^2$

$b_1$	+61.0	+ 92"	-10° 34'	252° 12'	210° 30'	$b_1 b_2$
$b_2$	61.6	+ 89	-10 53	253 26	211 44	
$b^1$	63.4	+ 84	-11 34	257 18	215 36	

May 30 23<sup>h</sup> 27<sup>m</sup>

$a^1$	+ 3.6	+170	+ 8 26	190 26	204 14	
$a$	10.7	+193	+ 8 8	196 39	210 27	$a$
$a^2$	11.3	+205	+ 8 42	197 23	211 11	$a^2$
$a^3$	12.0	+202	+ 8 22	197 54	211 42	$a^3$
$a^4$	12.1	+275	+12 38	199 24	213 12	
$a^5$	16.5	+223	+ 8 33	202 3	215 51	$a^5$
$a^6$	18.9	+232	+ 8 32	204 14	218 2	
$b_1^{\text{n}}$	17.3	- 90	-10 35	197 39	211 27	$b_1$
$b_1^{\text{s}}$	18.4	-113	-10 35	197 39	211 27	
$b_2$	18.5	-115	-11 31	198 0	211 48	
$b^1$	21.6	- 99	-11 17	200 51	214 39	$b_2$
$b^2$	21.6	-117	-12 21	200 36	214 24	$b^3$

May 31 1<sup>h</sup> 59<sup>m</sup>

$a^1$	- 6.1	+173	+10 59	181 27	210 46	
$a$	6.1	+124	+ 8 6	180 40	209 59	$a$
$a^2$	5.1	+136	+ 8 34	181 40	210 59	
$a^3$	4.7	+133	+ 8 18	181 59	211 18	
$a^4$	3.3	+180	+10 45	183 38	212 57	$a^1$
$a^5$	0.4	+143	+ 7 55	185 36	214 55	
$a^6$	+ 2.3	+193	+10 15	188 36	217 55	$a^2?$
$a^7$	3.1	+216	+11 25	189 39	218 58	
$b^1$	- 2.3	-184	-10 39	178 44	208 3	
$b^2$	1.7	-221	-12 58	178 35	207 54	$b^1$
$b_1^{\text{n}}$	+ 0.5	-166	-10 44	181 9	210 38	$b_1 b_2$
$b_1^{\text{s}}$	+ 0.5	-184	-10 44	181 9	210 38	
$b_2$	1.6	-191	-11 56	181 44	211 3	
$b_3$	2.9	-189	-12 8	182 52	212 11	
$b^3$	4.4	-175	-11 38	184 18	213 37	$b^3$
$b^4$	5.6	-186	-12 33	185 6	214 25	$b^5$
$c$	63.1	+136	- 6 28	252 20	281 39	$c$

June 1 3<sup>h</sup> 12<sup>m</sup>

$a$	-21.6	+ 75	+ 8 46	166 2	210 6	$a$
$a^1$	18.9	+105	+ 9 56	168 45	212 49	
$a^2$	15.9	+123	+10 19	171 33	215 37	
$b^1$	18.3	-271	-12 6	162 48	206 52	
$b^2$	16.5	-195	- 8 3	165 55	209 59	$b^3$
$b_1^{\text{n}}$	-218	-10 3	166 32	210 36	$b^4$	
$b_1^{\text{s}}$	15.1	-230	-10 3	166 32	210 36	
$b_2^{\text{n}}$	-234	-11 29	166 55	210 59	$b$	
$b_2^{\text{s}}$	14.1	-255	-11 29	166 55	210 59	
$b^3$	12.1	-232	-11 11	168 51	212 55	
$b^4$	11.8	-260	-12 55	168 33	212 37	

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1865 June 1—Continued						
$b^5$	-10.5	-244"	-12° 15'	169° 57'	214° 1'	
$c^1$	+54.8	+116	- 5 27	236 22	280 26	$c^1$
$c$	55.7	+104	- 6 21	237 26	281 30	$c$
$c^2$	56.9	+130	- 5 4	239 38	283 42	$c^2$
June 2 3 <sup>h</sup> 38 <sup>m</sup>						
$a$	-35.5	+ 37	+ 9 34	151 54	210 15	$a$
$a^1$	34.0	+ 88	+12 15	153 55	212 16	
$b^1$	32.5	-276	- 9 21	149 9	207 30	
$b^2$	31.9	-257	- 8 21	150 8	208 29	
$b^3$	30.7	-250	- 8 12	151 26	209 47	
$b^4$ <sup>n</sup>	29.7	-264	- 9 36	151 54	210 15	$b^1$
$b$ <sup>n</sup>	29.1	-278	-11 2	152 39	211 0	$b$
$b^5$	16.9	-262	-11 55	163 22	221 43	$b^6$
$b^6$	13.3	-223	-10 23	167 10	225 31	
$c^1$	+43.4	+ 65	- 5 38	220 45	279 6	}C
$c$	45.3	+ 64	- 6 5	222 49	281 10	
$c^2$	47.8	+ 98	- 4 39	226 11	284 32	
June 4 1 <sup>h</sup> 14 <sup>m</sup>						
$a$	-56.2	- 29	+ 9 43	125 32	210 33	
$b^1$ <sup>n</sup>	50.9	-329	- 9 15	125 25	210 26	
$b$ <sup>n</sup>	50.2	-354	-11 11	126 6	211 7	
$b^2$	49.8	-322	- 8 46	127 21	212 22	
$b^3$	43.7	-332	-10 36	134 21	219 22	
$b^4$	43.7	-348	-11 33	133 48	218 49	
$b^5$	41.8	-366	-13 1	135 21	220 22	
$b^6$	40.8	-348	-12 9	137 3	222 4	
$c^1$	+15.9	- 17	- 4 11	192 31	277 32	}A
$c^2$	17.8	- 56	- 6 52	193 35	278 36	
$c^3$	18.3	- 13	- 4 27	194 38	279 39	
$c$	19.1	- 29	- 5 33	195 5	280 6	
$c^4$	21.6	- 9	- 4 53	197 29	282 30	
$c^5$	23.0	+ 8	- 4 5	198 55	283 56	
June 7 0 <sup>h</sup> 27 <sup>m</sup>						
$a$	-29.5	-178	- 4 39	149 38	276 18	$a$
$a^1$	27.7	-135	- 2 27	151 58	278 38	
$a^2$	24.3	-142	- 3 28	154 51	281 31	$a^1$
$b^1$	+51.9	+264	+ 6 8	230 10	356 50	$b^1$
$b^2$	53.8	+274	+ 6 21	233 8	359 48	$b^2$
$b^3$	56.1	+277	+ 6 4	236 48	3 28	$b^4$
Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
$b^4$	-56.9	+242"	+ 3° 52'	236° 48'	3° 28'	$b^7$
$b$ <sup>n</sup>	56.6	+280	+ 5 45	238 37	5 17	$b$
$b^5$	57.6	+271	+ 3 11	238 54	5 34	$b^8$
$b^6$	61.2	+276	+ 5 1	246 19	12 59	
June 8 2 <sup>h</sup> 12 <sup>m</sup>						
$a$	-44.2	-221	- 4 44	133 20	274 58	
$a^1$	39.4	-203	- 4 29	138 46	280 24	
$b^1$	+40.4	+219	+ 6 2	214 41	356 19	
$b^2$	42.3	+217	+ 5 35	216 35	358 13	$a^3$
$b^3$	43.1	+207	+ 4 50	217 16	358 54	$a^4$
$b^4$	45.7	+235	+ 6 0	220 46	2 24	
$b^5$	45.7	+207	+ 4 21	220 7	1 45	$a^{10}$
$b^6$	47.0	+267	+ 7 39	223 3	4 41	
$b$ <sup>n</sup>	46.9	+239	+ 5 36	222 45	4 23	$a$
$b^7$	48.0	+228	+ 3 7	222 48	4 26	$a^{12}$
$b^8$	49.6	+203	+ 3 23	224 35	6 13	
June 11 1 <sup>h</sup> 7 <sup>m</sup>						
$a^1$	- 8.7	+ 40	+ 4 37	166 33	349 44	
$a^2$	6.1	+ 42	+ 4 19	168 45	351 56	
$a^3$	1.7	+ 80	+ 5 51	172 47	355 58	$a^1$
$a^4$	0.7	+ 74	+ 5 20	173 32	356 43	$a^2$
$a^5$	+ 2.1	+ 49	+ 3 25	175 29	358 40	
$a^6$	2.5	+130	+ 8 9	176 45	359 56	$a^4$
$a^7$	3.0	+ 93	+ 5 52	176 44	359 55	$a^5$
$a^8$	4.2	+ 95	+ 5 48	177 42	0 53	$a^6$
$a^9$	5.2	+ 60	+ 3 34	178 6	1 17	$a^7$
$a^{10}$	5.6	+ 86	+ 4 10	177 38	0 49	$a^8$
$a^{11}$	7.0	+158	+ 9 4	180 51	4 2	$a^9$
$a^{12}$	7.7	+ 67	+ 3 35	180 14	3 25	
$a$	7.8	+116	+ 6 27	180 56	4 7	$a$
June 12 2 <sup>h</sup> 22 <sup>m</sup>						
$a^1$	-18.9	+ 28	+ 5 32	156 53	354 50	$a^1$
$a^2$	17.5	+ 25	+ 5 8	158 3	356 0	$a^2$
$a^3$	17.0	+ 32	+ 5 28	158 36	356 33	
$a^4$	15.4	+ 56	+ 6 42	160 8	358 5	
$a^5$	13.8	+ 37	+ 5 17	161 17	359 14	$a^4$
$a^6$	13.0	+ 39	+ 5 16	162 1	359 58	$a^5$
$a^7$	11.6	+ 21	+ 4 0	163 0	0 57	$a^6$
$a^8$	10.8	+ 35	+ 4 41	163 48	1 45	
$a^9$	9.1	+ 97	+ 8 8	165 49	3 46	
$a$ <sup>s</sup>	9.3	+ 53	+ 6 3	165 40	3 37	$a, a_2$
$b$ <sup>n</sup>	8.4	+ 72				
$b$	1.0	-132	- 6 41	169 57	7 54	
$c$	+ 3.1	+243	+14 59	177 47	15 44	



Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1865 June 14 0 <sup>h</sup> 14 <sup>m</sup>						
$a^1$	-45 <sup>s</sup> .7	- 14''	+ 6° 37'	129° 21'	354° 7'	$a^1$
$a^2$	44.9	- 23	+ 5 59	130 4	354 50	} $a^?$
$a^3$	44.2	- 28	+ 5 36	130 50	355 36	
$a^4$	41.9	- 20	+ 5 46	133 21	358 7	
$a^5$	41.4	- 21	+ 5 39	133 51	358 37	
$a^6$	39.9	- 39	+ 4 23	135 10	359 56	
$a^7$	37.5	- 2	+ 6 16	137 57	2 43	
$a_1$	37.5	+ 5	+ 6 41	138 0	2 46	
$a_2$	36.9	+ 14	+ 7 8	138 39	3 25	
June 17 23 <sup>h</sup> 17 <sup>m</sup>						
$a^1$	-67.8	- 39	+ 6 25	88 5	354 24	
$a$	66.8	- 48	+ 5 51	91 56	358 15	
$b^1$	40.2	+ 89	+ 11 38	132 42	39 1	
$b^2$	40.0	+ 80	+ 11 4	132 55	39 14	
$b$	35.9	+ 98	+ 11 41	137 7	43 26	
June 23 0 <sup>h</sup> 29 <sup>m</sup>						
$a$	+17.5	-204	-11 39	175 25	166 39	
$a^1$	20.6	-200	-11 42	178 8	169 22	
$a^2$	21.2	-200	-11 45	178 37	169 51	
$b$	64.3	- 71	- 9 1	230 20	221 32	
June 25 1 <sup>h</sup> 9 <sup>m</sup>						
$a$	+46.0	-121	- 9 7	201 29	221 10	$b$
June 27 2 <sup>h</sup> 14 <sup>m</sup>						
$a$	+11.4	+ 72	+ 6 20	167 50	216 13	$a$
$a^1$	11.5	+ 63	+ 5 48	167 52	216 15	
$b$	17.3	-171	- 8 42	171 51	220 14	
$b^1$	17.7	-170	- 8 40	172 12	220 35	
$c$	24.6	-206	-11 23	178 16	226 39	
June 28 0 <sup>h</sup> 28 <sup>m</sup>						
$a$	+ 2.8	-183	- 8 22	158 43	220 6	$b$
$a^1$	3.9	-150	- 6 26	159 48	221 11	
June 29 2 <sup>h</sup> 26 <sup>m</sup>						
$a$	-49.0	-214	- 8 40	109 14	185 49	$a$
$a^1$	45.2	-213	- 8 37	113 44	190 19	$a^2$
$b$	14.5	-215	- 9 28	143 8	219 43	
$b^1$	13.9	-207	- 9 0	143 42	220 17	

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
June 30 2 <sup>h</sup> 53 <sup>m</sup>						
$a$	-59 <sup>s</sup> .3	-184''	- 7° 18'	94° 4'	184° 56'	
$a^1$	56.4	-211	- 8 53	98 15	189 7	
$a^2$	56.0	-193	- 7 45	99 14	190 6	
$a^3$	55.3	-204	- 8 25	100 0	190 52	
$b^1$	45.1	-241	-10 35	112 33	203 25	
$b$	43.9	-258	-11 38	113 43	204 35	
$c$	+27.5	- 70	- 2 29	178 21	269 13	
July 2 3 <sup>h</sup> 32 <sup>m</sup>						
$a$	-60.0	+ 64	+ 7 1	92 4	211 23	
$a^1$	59.4	+ 63	+ 6 59	93 6	212 25	
July 5 1 <sup>h</sup> 49 <sup>m</sup>						
$a$	+61.9	- 55	- 2 10	214 42	15 7	$b$
July 8 22 <sup>h</sup> 15 <sup>m</sup>						
$a^1$	+16.9	+ 60	+ 7 35	162 2	2 27	
$a$	17.4	+ 58	+ 7 28	162 25	2 50	$a$
$a^2$	18.0	+ 64	+ 7 49	163 0	3 25	$a^1$
$a^3$	22.2	+ 46	+ 6 43	166 37	7 2	$a^2?$
$a^4$	23.0	+ 60	+ 7 33	167 22	7 47	
$b$	29.9	- 85	- 1 16	173 34	13 59	$b$
$c$	65.6	- 96	- 3 58	221 39	62 4	$c$
July 9 0 <sup>h</sup> 26 <sup>m</sup>						
$a$	- 1.3	+ 35	+ 6 4	145 33	1 17	$a$
$a^1$	+ 2.2	+ 39	+ 6 23	148 28	4 12	
$a^2$	5.6	+ 23	+ 5 29	151 21	7 5	$a^2$
$b$	13.1	-116	- 2 49	157 53	13 17	$b$
$c$	59.0	-141	- 5 43	207 0	62 44	$c$
$c$		-152				
July 10 0 <sup>h</sup> 45 <sup>m</sup>						
$a$	-19.4	+ 58	+ 6 54	129 4	359 2	
$a^1$	18.2	+ 78	+ 8 10	130 4	0 2	
$a^2$	11.7	+ 48	+ 6 37	135 46	5 44	
$b$	3.3	-101	- 2 7	143 10	13 8	$a$
$c$	+49.2	-141	- 4 44	192 13	62 11	$b$
$c$		-152				
July 14 22 <sup>h</sup> 45 <sup>m</sup>						
$a$	-56.2	- 32	- 2 19	86 49	11 44	
$b$	7.7	-136	- 4 37	136 23	61 18	$a$
$b$	7.0	-152				

Letter	$\Delta a$	$\Delta \delta$	$h$	$L$	$L'$	Letter on next date
1865 July 14—Continued						
$b^1$	- 4 <sup>s</sup> 8	-115 <sup>m</sup>	- 2° 42'	138° 26'	63° 21'	
$b^2$	4.0	-168	- 5 53	139 17	64 12	
July 17 23 <sup>h</sup> 35 <sup>m</sup>						
$a^{\text{n}}$	-49.6	- 63	- 4 20	93 18	60 49	$a$
$s$	48.9	- 72				
$b$	+49.5	-274	- 9 40	188 38	156 9	$b_1 b_2$
$b^1$	50.7	-269	- 9 36	190 12	157 43	
$b^2$	52.6	-253	- 8 37	192 26	159 57	
$b^3$	53.4	-283	-10 33	194 24	161 55	$b^2$
July 18 3 <sup>h</sup> 10 <sup>m</sup>						
$a$	-59.4	- 49	- 5 20	77 30	61 8	
$b_1$	+34.8	-300	-11 20	171 24	155 2	$a^1$
$b_2$	35.4	-288	-10 33	171 50	155 28	$a$
$b^1$	37.6	-300	-11 14	174 19	157 57	$a^2$
$b^2$	40.8	-291	-10 36	177 33	161 11	$a^5$
July 21 2 <sup>h</sup> 40 <sup>m</sup>						
$a^1$	- 9.5	-242	-10 30	128 47	154 14	$a^1$
$a$	8.2	-242	-10 21	129 54	155 21	$a$
$a^2$	6.3	-253	-10 50	131 36	157 3	
$a^3$	3.6	-281	-12 17	134 6	159 33	
$a^4$	2.8	-244	- 9 54	134 32	159 59	
$a^5$	2.8	-260	-10 54	134 38	160 5	$a^4?$
July 23 0 <sup>h</sup> 21 <sup>m</sup>						
$a^1$	-37.0	-163	- 9 30	101 30	153 40	
$a$	36.5	-164	- 9 29	102 1	154 11	
$a^2$	35.7	-156	- 8 51	102 51	155 1	
$a^3$	34.9	-172	- 9 43	103 40	155 50	
$a^4$	32.1	-189	-10 18	106 31	158 41	
$b$	+62.2	-156	- 0 31	202 39	254 50	$B$
July 27 23 <sup>h</sup> 11 <sup>m</sup>						
$a$	+12.3	+ 57	+10 35	139 33	247 10	$A$
$a^1$	12.8	+ 65	+11 7	139 58	247 35	
$a^2$	13.8	+ 70	+11 32	140 48	248 25	
$a^3$	15.2	+ 79	+12 15	141 58	249 35	
$a^4$	17.4	+ 51	+10 50	144 8	251 45	
$a^5$	17.8	+ 59	+11 21	144 23	252 0	
$b^1$	19.8	-202	- 4 2	148 34	256 11	
$b$	21.1	-209	- 4 2	149 42	257 9	
$b^2$	21.7	-223	- 5 6	150 29	258 6	
$b^3$	24.1	-221	- 4 44	152 40	260 17	

Letter	$\Delta a$	$\Delta \delta$	$b$	$L$	$L'$	Letter on next date
July 29 0 <sup>h</sup> 36 <sup>m</sup>						
$a^1$	-18 <sup>s</sup> 0	+127 <sup>m</sup>	+10° 20'	110° 37'	247° 8'	
$a$	17.3	+132	+10 45	111 10	247 41	$b$
$a^2$	15.5	+125	+10 39	112 50	249 21	
$a^3$	15.0	+143	+11 48	113 4	249 35	
$b$	+12.1	+ 55	+10 44	137 25	273 56	$c^2$
$b^1$	12.5	+ 55	+10 47	137 46	274 17	
$b^2$	13.4	+ 62	+11 19	138 27	274 58	
$b^3$	14.9	+ 88	+13 5	139 36	276 7	
$b^4$	15.2	+ 48	+10. 43	140 11	276 42	$c^5$
$b^5$	15.7	+ 71	+12 10	140 27	276 58	$c$
$c$	15.6	- 74	+ 3 32	141 37	278 8	$d$
$c^1$	18.6	- 81	+ 3 30	144 22	280 53	$d^2$
$c^2$	20.3	- 60	+ 4 57	145 40	282 11	
July 30 3 <sup>h</sup> 24 <sup>m</sup>						
$a$	-46.1	+194	+ 8 20	80 23	232 34	
$b$	32.3	+162	+ 9 36	95 43	247 54	
$c^1$	5.9	+124	+12 13	120 3	272 14	
$c^2$	5.9	+ 92	+10 19	120 27	272 38	
$c^3$	3.9	+117	+12 8	121 52	274 3	
$c^4$	3.9	+ 69	+ 9 18	122 26	274 37	
$c^5$	2.8	+ 84	+10 22	123 15	275 26	$C$
$c^{\text{n}}$	1.9	+130	+12 42	123 32	275 43	
$s$		+112				
$c^6$	0.5	+ 60	+ 9 18	125 26	277 37	
$c^7$	+ 0.0	+ 89	+11 6	125 32	277 43	
$d$	- 3.0	- 40	+ 3 35	124 53	277 4	$B$
$d^1$	1.4	- 53	+ 2 29	125 56	278 7	
$d^2$	+ 2.5	- 48	+ 3 23	129 10	281 21	
August 4 23 <sup>h</sup> 19 <sup>m</sup>						
$a$	-62.1	+216	- 5 24	53 10	273 8	
$b^2$	59.5	+200	+ 3 8	54 51	274 49	
$b^3$	57.6	+216	+ 4 51	57 59	277 57	
$b$	57.6	+223	+ 5 8	57 43	277 41	
$c^1$	58.4	+334	+10 46	49 50	269 48	
$c$	57.9	+358	+12 16	49 24	269 22	
$c^2$	56.6	+300	+ 9 42	55 59	275 57	
$c^3$	55.8	+326	+11 25	56 6	276 4	
$c^4$	55.4	+291	+ 9 40	58 46	278 44	
$c^5$	55.2	+348	+12 51	56 3	276 1	
$c^6$	55.0	+319	+11 21	58 3	278 1	
August 8 0 <sup>h</sup> 58 <sup>m</sup>						
$a^1$	-11.7	+ 71	+ 8 0	106 59	24 3	$a$
$a_1$	9.5	+ 60	+ 7 51	109 0	26 4	
$a_2$	8.8	+ 64	+ 8 15	109 32	26 36	

## 1865 August 8—Continued

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$a^2$	-5.0	+24"	+6° 45'	113° 23'	30° 27'	
$b$	+20.3	-252	-4 31	139 12	56 16	$c$
$c^1$	59.1	-63	+10 34	182 28	99 32	$d^1$
$c^2$	60.0	-25	+13 51	183 57	101 1	$d^2$
$c_1$	60.6	-53	+12 10	185 25	102 29	$d_1$
$c_2$	60.9	-50	+12 19	186 11	103 15	$d_2$

August 9 1<sup>h</sup> 5<sup>m</sup>

$a^s$	-24.4	+121	+7 57	93 49	24 59	
$b$	19.0	+45	+4 44	100 5	31 15	
$c$	+5.7	-211	-4 42	124 58	56 8	
$c^1$	7.2	-217	-4 45	126 20	57 30	
$d^1$	50.8	-65	+11 16	168 0	99 10	$a$
$d^2$	52.0	-32	+13 21	169 25	100 35	$a^3$
$d_1$	52.9	-54	+12 7	170 55	102 5	$a^4$
$d_2$	53.5	-52	+12 17	171 49	102 59	$a^5$

August 12 0<sup>h</sup> 20<sup>m</sup>

$a^1$	+13.5	+35	+11 39	125 14	98 4	
$a$	15.6	+40	+12 22	126 55	99 45	$a$
$a^2$	16.0	+30	+11 53	127 28	100 18	
$a^3$	16.9	+63	+14 1	127 50	100 40	
$a^4$	17.7	+45	+13 6	128 47	101 37	$a^1$
$a^5$	18.6	+45	+13 21	129 50	102 40	

August 14 0<sup>h</sup> 28<sup>m</sup>

$a$	-13.3	+156	+12 17	98 1	99 0	
$a^1$	10.1	+152	+12 55	100 55	101 54	
$a^2$	3.7	+149	+14 24	106 27	107 26	
$b$	+56.1	-428	-9 21	185 55	186 54	$a$

August 16 1<sup>h</sup> 11<sup>m</sup>

$a$	+41.0	-424	-10 51	158 34	188 2	$a$
$a^1$	44.3	-446	-10 31	162 56	192 24	$a^2$

August 18 0<sup>h</sup> 45<sup>m</sup>

$a$	+17.4	-364	-10 5	130 15	187 32	$b$
$a^1$	17.9	-357	-9 32	130 32	187 49	$b^1$
$a^2$	22.1	-378	-9 52	134 54	192 11	
$b$	44.0	-425	-8 37	160 1	217 18	$c$

August 19 0<sup>h</sup> 33<sup>m</sup>

$b$	+3.6	-310"	-10° 8'	116° 13'	187° 25'	$a$
$b^1$	4.0	-306	-9 47	116 28	187 40	
$c$	33.0	-395	-8 23	145 14	216 26	
$d$	64.0	-116	+11 47	187 32	258 44	$b$

August 20 1<sup>h</sup> 5<sup>m</sup>

$a$	-10.5	-241	-9 52	102 0	187 33	
$b$	+60.5	-132	+11 23	177 14	262 47	$a$
$b^1$	60.5	-167	+9 15	178 14	263 47	$a^2$
$b^2$	63.0	-114	+12 16	184 46	270 19	$a^6$

August 24 1<sup>h</sup> 3<sup>m</sup>

$a_1$	+19.6	-21	+11 18	119 47	261 27	
$a$	20.3	-25	+11 5	120 29	262 9	$a$
$a_2$	21.4	-30	+11 15	121 35	263 15	
$a^1$	21.8	-72	+8 56	122 42	264 22	$a^3$
$a^2$	22.1	-42	+10 44	122 26	264 6	$a^2$
$a^3$	25.0	-107	+7 43	126 14	267 54	
$a^4$	25.8	-63	+10 27	126 15	267 55	$a^5$
$a^5$	27.1	-68	+10 29	127 34	269 14	
$a^6$	27.6	-37	+12 24	127 31	269 11	$a^6$
$a^7$	27.9	-53	+11 32	128 5	269 45	
$a^8$	28.4	-65	+10 58	128 46	270 26	$a^7$

August 26 0<sup>h</sup> 58<sup>m</sup>

$a^1$	-8.1	+80	+9 8	92 5	261 46	$a^3$
$a$	7.0	+115	+11 26	92 11	261 52	$a$
$a^2$	5.7	+97	+10 50	93 44	263 25	
$a^3$	5.7	+78	+9 46	94 9	263 50	$a^4$
$a^4$	2.6	+92	+11 31	96 25	266 6	$a^5$
$a^5$	0.9	+76	+11 8	98 12	267 53	$a^6$
$a^6$	+0.1	+101	+12 50	98 28	268 9	$a^7$
$a^7$	0.9	+55	+10 30	100 9	269 50	$a^8$
$a^8$	5.4	+69	+12 38	103 41	273 22	$a^{11}$

August 27 1<sup>h</sup> 27<sup>m</sup>

$a^1$	-28.1	+186	+8 10	70 57	254 57	
$a^2$	25.7	+198	+9 41	72 50	256 50	
$a^3$	22.1	+179	+9 54	76 34	260 34	
$a$	20.0	+193	+11 24	78 4	262 4	
$a^4$	18.4	+140	+9 2	80 54	264 54	
$a^5$	15.8	+179	+12 5	82 9	266 9	
$a^6$	14.2	+159	+11 31	84 2	268 2	



Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1865 August 27—Continued						
$a^7$	-13.8	+179"	+12° 45'	83° 50'	267° 50'	
$a^8$	12.9	+126	+10 6	85 58	269 58	
$a^9$	12.4	+154	+11 49	85 40	269 40	
$a^{10}$	9.8	+ 83	+ 8 44	89 36	273 36	
$a^{11}$	7.6	+147	+12 59	89 55	273 55	
September 6 1 <sup>h</sup> 17 <sup>m</sup>						
$a^1$	-55.7	+378	+ 3 54	17 7	341 21	$a^1$
$a^2$	54.9	+381	+ 4 35	19 2	343 16	
$a^s$		+392	+ 5 56	21 11	345 25	$a$
$a_n$	53.5	+399				
$a^3$	51.1	+417	+ 8 31	24 11	348 25	
September 7 0 <sup>h</sup> 52 <sup>m</sup>						
$a^1$	-57.0	+419	+ 4 20	6 37	344 39	
$a$	56.0	+439	+ 5 59	8 6	346 8	
September 10 21 <sup>h</sup> 5 <sup>m</sup>						
$a$	-12.9	+145	+10 21	71 40	89 35	
September 12 23 <sup>h</sup> 47 <sup>m</sup>						
$a^1$	+40.9	-303	+ 3 21	129 17	176 51	
$a^2$	42.0	-304	+ 3 34	130 38	178 12	
$a$	42.4	-306	+ 3 34	131 11	178 45	
September 14 0 <sup>h</sup> 3 <sup>m</sup>						
$a$	+18.8	-455	-11 49	110 2	186 4	$a$
$b^1$	37.4	-536	-11 8	132 43	208 45	
$b$	38.6	-534	-10 42	134 7	210 9	
$b^2$	38.6	-556	-12 5	135 25	211 27	$b^2b^3$
September 15 0 <sup>h</sup> 37 <sup>m</sup>						
$a$	+ 5.3	-379	-11 58	95 3	185 12	
$b^1$	26.6	-483	-10 53	117 31	207 40	
$b$	27.4	-481	-10 30	118 15	208 24	$b b^1$
$b^2$	29.2	-508	-11 35	121 12	211 21	$b^4$
$b^3$	29.3	-520	-12 17	121 50	211 59	$b^3$
September 17 0 <sup>h</sup> 20 <sup>m</sup>						
$a$	-36.6	- 23	- 8 59	48 6	166 9	$a^1$
$a^1$	33.0	- 30	- 7 46	51 48	169 51	$a^2$
$b$	+ 2.1	-322	- 9 50	88 56	206 59	$b$
$b^1$	2.5	-324	- 9 48	89 19	207 22	
Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$b^2$	+ 5.6	-380"	-11° 53'	93° 29'	211° 32'	
$b^3$	6.2	-380	-11 40	93 59	212 2	
$b^4$	6.2	-366	-10 59	93 38	211 41	
September 19 0 <sup>h</sup> 20 <sup>m</sup>						
$a^1$	-55.2	+150	- 9 10	19 6	165 14	
$a^2$	54.6	+140	- 9 21	20 28	166 36	
$a^3$	52.8	+136	- 8 33	23 30	169 38	
$a$	52.1	+161	- 6 51	23 47	169 55	
$b$	24.0	-123	- 9 3	61 18	207 26	
September 22 2 <sup>h</sup> 34 <sup>m</sup>						
$a$	-50.0	+ 7	-14 26	27 12	216 44	} $A$
$a^1$	48.8	- 9	-14 39	29 14	218 46	
$b^1$	+57.1	-345	+ 5 17	148 5	337 37	
$b_n$		-277	+ 8 55	146 48	336 20	$b$
$b_s$	57.9	-297				
$b^2$	58.5	-331	+ 6 8	151 45	341 17	$b^4b^5$
$b^3$	59.1	-231	+12 23	147 10	336 42	
September 24 1 <sup>h</sup> 25 <sup>m</sup>						
$a^1$	-61.4	+159	-13 36	358 3	214 59	
$a$	61.4	+154	-13 51	358 20	215 16	
$b^1$	+43.7	-211	+10 23	118 1	334 57	$a^1$
$b^2$	43.9	-182	+12 6	117 34	334 30	$a^8$
$b_n$	43.5	-232	+ 8 29	119 52	336 48	$a$
$b_s$	45.1	-259				
$b^3$	44.4	-217	+10 16	119 7	336 3	$a^2$
$b^4$	46.2	-322	+ 4 46	124 43	341 39	$a^5$
$b^5$	47.1	-315	+ 5 24	125 42	342 38	$a^6$
$b^6$	47.4	-205	+11 45	122 40	339 36	$a^7$
September 25 2 <sup>h</sup> 4 <sup>m</sup>						
$a^1$	+31.8	-156	+ 9 50	102 36	333 56	$b^1 \geq b^2$
$a^2$	33.3	-154	+10 27	104 2	335 22	
$a^3$	33.3	-244	+ 5 27	106 25	337 45	
$a$	32.7	-175	+ 8 52	105 3	336 23	$b$
$a^4$	34.9	-184	+ 9 18	106 27	337 47	
$a^5$	36.1	-264	+ 5 12	109 47	341 7	$b^4$
$a^6$	36.8	-269	+ 5 8	110 41	342 1	$b^5$
$a^7$	37.5	-156	+11 41	108 29	339 49	
$a^8$	32.1	-131	+11 20	102 17	333 37	
$a^9$	34.2	-128	+12 10	104 17	335 37	
September 27 0 <sup>h</sup> 11 <sup>m</sup>						
$a$	-55.3	+195	- 7 55	8 42	267 0	
$a^1$	54.5	+162	- 9 8	11 22	269 40	

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1865 September 27—Continued						
$b^1$	+ 6.3	— 2"	+ 9° 6'	74° 20'	332° 38'	
$b^2$	6.9	— 9	+ 9 2	74 54	333 12	$a^1$
$b^3$	8.7	— 16	+ 8 51	77 38	335 56	$a$
$b^4$	10.3	— 42	+ 8 13	80 25	338 43	
$b^5$	12.0	— 58	+ 4 55	82 24	340 42	
$c$	12.4	— 122	+ 5 10	83 6	341 24	$a^2$
	23.5	+ 37	+ 17 37	88 13	346 31	$b^1$
September 29 0 <sup>h</sup> 29 <sup>m</sup>						
$a^1$	— 19.4	+ 163	+ 7 22	46 52	333 25	
$a^2$	17.6	+ 174	+ 8 34	49 6	335 39	$a$
$a^3$	15.8	+ 154	+ 5 22	54 16	340 49	$a^1$
$b$	13.5	+ 77	+ 16 38	57 31	344 4	
$b^1$	4.4	+ 220	+ 17 37	61 14	347 47	
October 1 0 <sup>h</sup> 32 <sup>m</sup>						
$a^1$	— 39.3	+ 360	+ 8 19	20 31	335 10	$a$
$a^2$	37.6	+ 344	+ 5 41	26 24	341 3	
$a^3$	35.8	+ 275				
October 3 0 <sup>h</sup> 45 <sup>m</sup>						
$a^1$	— 51.6	+ 481	+ 7 55	352 38	335 29	
$a^2$	50.7	+ 492	— 12 12	59 3	41 54	
$b$	13.3	— 247	— 11 57	61 9	44 0	
$b^1$	11.1	— 259	+ 6 52	121 41	104 32	$a$
$c$	+ 50.7	— 311				
October 6 23 <sup>h</sup> 52 <sup>m</sup>						
$a$	+ 19.3	— 137	+ 6 17	79 35	104 1	$a$
October 9 1 <sup>h</sup> 39 <sup>m</sup>						
$a^1$	— 21.1	+ 174	+ 8 4	35 20	102 54	
$a^2$	20.0	+ 194	— 13 44	108 34	176 8	$a$
$b^1$	+ 34.4	— 576	— 11 7	108 41	176 15	
$b^2$	36.4	— 600	— 17 10	116 41	184 15	$a^1$
$b^3$	37.2	— 554	— 14 48	114 52	182 26	$a^2$
$b^4$	37.8	— 654	— 15 53	117 58	185 32	
$b^5$	38.5	— 620	— 12 39	115 29	183 3	$a^5$
$c$	39.4	— 641				
	40.4	— 594				
Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1865 October 11 23 <sup>h</sup> 38 <sup>m</sup>						
$a^1$	+ 14.9	— 444"	— 13° 5'	81° 38'	176° 6'	$a_1 a_2$
$a^2$	16.0	— 478	— 18 9	89 13	183 41	$a^3$
$a^3$	17.3	— 569	— 14 58	87 40	182 8	
$a^4$	19.5	— 520	— 13 25	87 47	182 15	$a^4?$
$a^5$	20.2	— 500	— 14 30	90 10	184 38	$a^6$
$a^6$	21.3	— 527	— 12 6	89 1	183 29	$a^7$
$a^7$	22.6	— 489	— 12 20	90 57	185 25	$a^8$
$a^8$	23.1	— 502	— 3 9	121 24	215 52	
$b$	24.6	— 478	— 2 29	123 18	217 46	$b^1$
$b^1$	50.3	— 471				
$b^2$	51.5					
October 13 0 <sup>h</sup> 21 <sup>m</sup>						
$a^1$	— 10.8	— 256	— 12 24	52 16	175 13	$a_1$
$a^2$	9.5	— 272	— 12 50	54 4	177 1	$a_2$
$a^3$	9.5	— 267				
$a^4$	7.6	— 300				
$a^5$	7.1	— 233	— 9 27	53 52	176 49	
$a^6$	5.6	— 320	— 13 16	57 18	180 15	
$a^7$	5.1	— 397	— 17 52	60 5	183 2	
$a^8$	3.7	— 322	— 12 59	59 4	182 1	
$a^9$	3.4	— 411	— 17 57	61 56	184 53	
$a^{10}$	1.6	— 368	— 14 44	62 5	185 2	$a^3$
$a^{11}$	1.3	— 327	— 12 18	61 7	184 4	
$a^{12}$	+ 0.1	— 345	— 12 47	62 41	185 38	$a^4$
$b$	32.3	— 354	— 1 29	90 32	213 29	$b$
$b^1$	35.3	— 384	— 2 9	94 40	217 37	
October 16 0 <sup>h</sup> 32 <sup>m</sup>						
$a^1$	— 46.3	+ 16	— 12 6	11 58	177 8	$a_1$
$a^2$	44.5	+ 32	— 12 20	14 31	179 41	$a_2$
$a^3$	44.1	+ 16				
$a^4$	43.1	— 9				
$a^5$	42.1	— 58	— 14 59	17 35	182 45	
$a^6$	42.0	— 26	— 13 11	16 58	182 8	$a^2$
$a^7$	40.9	— 81	— 14 44	19 3	184 13	$a^3$
$a^8$	40.1	— 44	— 13 16	19 23	184 33	$a^4$
$b$	7.4	— 77	— 1 11	48 33	213 43	$b$
October 17 0 <sup>h</sup> 2 <sup>m</sup>						
$a^1$	— 54.4	+ 113	— 12 28	356 9	175 3	$a$
$a^2$	53.2	+ 87				
$a^3$	52.1	+ 87	— 12 53	359 18	178 12	$a^1$
$a^4$	52.1	+ 64				
$a^5$	53.3	+ 145	— 9 51	355 32	174 26	

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1865 October 17—Continued						
$a^2$	-50.9	+ 60''	-13° 7'	1° 22'	180° 16'	
$a^3$	50.4	+ 12	-15 27	3 14	182 8	
$a^4$	49.2	+ 34	-13 40	4 14	183 8	
$b$	20.6	+ 21	- 1 34	32 29	211 23	
October 19 0 <sup>h</sup> 43 <sup>m</sup>						
$a_s^n$	-63.1	+223 +210	-11 55	328 13	175 35	$a_1$
$a_s^{1n}$	62.4	+214 +198	-11 55	331 53	179 15	$a_2$
November 11 22 <sup>h</sup> 42 <sup>m</sup>						
$a_1$	-36.0	- 67	-12 38	355 55	164 53	$c$
$a_s^n$	35.2	- 65 - 77	-12 34	356 43	165 41	$a$
$b$	+ 5.2	- 39	+ 2 33	28 56	197 54	$b$
$c$	19.8	- 23	+ 7 58	40 14	209 12	
November 13 0 <sup>h</sup> 3 <sup>m</sup>						
$a_s^n$	-56.7	+ 64 + 55	-12 57	328 10	166 0	$a$
$b$	24.5	+129	+ 1 57	0 0	197 50	
$c$	+53.8	-433	- 5 38	86 18	284 8	$c$
$c^1$	56.6	-433	- 5 1	91 36	289 26	$c^3$
November 15 1 <sup>h</sup> 32 <sup>m</sup>						
$a$	-67.2	+139	-12 28	299 32	166 18	
$b$	34.3	+201	+ 8 58	344 19	211 5	$a$
$c$	+34.4	-330	- 5 35	56 30	283 16	$b_1b_2$
$c^1$	39.0	-351	- 5 29	61 41	288 27	$b^2$
$c^2$	39.4	-339	- 4 43	61 42	288 28	$b^3$
$c^3$	40.1	-339	- 4 31	62 24	289 10	$b^4$
$c^4$	40.1	-360	- 5 39	63 5	289 51	$b^5$
November 16 0 <sup>h</sup> 33 <sup>m</sup>						
$a^1$	-46.3	+373	+ 8 10	328 50	209 4	
$a$	44.3	+376	+ 9 0	331 1	211 15	
$b_1$	+21.9	-261	- 5 32	42 30	282 44	
$b_2$	22.3	-270	- 5 55	43 4	283 18	
$b^1$	25.7	-288	- 5 58	46 23	286 37	
$b^2$	27.5	-286	- 5 20	47 56	288 10	
$b^3$	28.0	-273	- 4 29	48 2	288 16	
$b^4$	29.0	-274	- 4 16	48 53	289 7	
$b^5$	29.0	-297	- 5 32	49 30	289 44	
Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
November 24 23 <sup>h</sup> 44 <sup>m</sup>						
$a_1$	+45.5	- 8''	+12° 29'	50° 47'	42° 48'	$a_1a_2a_3$
$a_2$	46.1	- 3	+12 56	51 24	43 25	
$a_3$	46.5	- 13	+12 27	51 56	43 57	
$a^1$	48.9	- 66	+10 2	55 25	47 26	
$a^2$	50.3	- 22	+12 52	56 24	48 25	
$a^3$	50.3	- 52	+11 10	56 50	48 51	$a^2$
$a^4$	60.0	- 56	+11 6	57 44	49 45	$a^3$
$a^5$	52.2	- 43	+12 8	59 0	51 1	
November 26 1 <sup>h</sup> 9 <sup>m</sup>						
$a_1$	+18.2	+115	+12 8	21 47	42 42	$b_1b_2$
$a_s^n$	18.2	+129	+12 44	22 23	43 18	
$a_2$	19.9	+115	+12 44	22 23	43 18	
$a_3$	20.4	+110	+12 23	23 41	44 36	
$a^1$	22.2	+ 78	+11 2	25 42	46 37	$b^3$
$a^2$	24.2	+ 71	+11 7	27 29	48 24	$b^4$
$a^3$	25.4	+ 71	+11 25	28 31	49 26	$b^5$
$a^4$	25.9	+ 99	+13 8	28 32	49 27	
$b_1$	64.0	- 32	+14 47	75 2	95 57	$c_1c_2$
$b_2$	64.3	- 41	+14 20	75 46	96 41	
$b_1^1$	66.8	- 71	+13 8	82 29	103 24	$c_1^1$
$b_2^1$	67.2	- 62	+13 43	83 21	104 16	$c_2^1$
November 27 2 <sup>h</sup> 25 <sup>m</sup>						
$a$	- 5.3	-104	- 6 3	5 53	41 35	$a_1a_2a_3$
$a^1$	1.8	- 83	- 4 0	8 18	44 0	
$b_1$	+ 2.1	+193	+12 24	6 27	42 9	
$b_2$	3.6	+196	+12 55	7 36	43 18	
$b^1$	5.6	+209	+14 10	8 58	44 40	
$b^2$	6.3	+227	+15 22	9 13	44 55	
$b^3$	6.3	+156	+11 20	10 27	46 9	
$b^4$	8.6	+152	+11 40	12 22	48 4	
$b^5$	9.4	+147	+11 35	13 5	48 47	$a^2$
$c_1$	56.4	+ 5	+14 46	60 34	96 16	$b$
$c_2$	56.7	- 5	+14 15	61 6	96 48	
$c_1^1$	60.9	- 55	+12 21	68 15	103 57	$b^2$
$c_2^1$	61.6	- 25	+14 14	69 0	104 42	
$c^2$	63.1	- 67	+12 8	72 18	108 0	
November 30 0 <sup>h</sup> 35 <sup>m</sup>						
$a_1$	-38.5	+359	+11 58	325 26	42 9	$a$
$a_s^n$	37.7	+373 +361	+12 37	325 58	42 41	
$a_3$	36.8	+373	+13 11	326 43	43 26	
$a^1$	36.2	+343	+11 36	328 10	44 53	
$a^2$	32.5	+321	+11 15	332 20	49 3	



Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1865 November 30—Continued						
$b^{\text{n}}$	+20 <sup>s</sup> .2	+159''	+13° 51'	19° 29'	96° 12'	$b$
$b^{\text{s}}$	21.1	+138				
$b^1$	27.0	+121	+13 38	25 18	102 1	
$b^2$	29.9	+108	+13 34	28 5	104 48	
$c$	59.7	-481	-13 26	83 47	160 30	$c$
December 3 0 <sup>h</sup> 50 <sup>m</sup>						
$a$	61.0	+451	+12 49	284 7	43 5	
$b^{\text{n}}$	25.7	+327	+13 4	336 17	95 15	$a$
$b^{\text{s}}$	24.5	+311				
$c$	+38.4	-390	-13 51	42 28	161 26	$b$
December 5 23 <sup>h</sup> 27 <sup>m</sup>						
$a^{\text{s}}$	-48.6	+396	+13 12	309 3	95 17	
$a^{\text{n}}$	47.7	+404				
$b$	+13.1	-285	-13 36	15 10	161 24	
December 11 1 <sup>h</sup> 10 <sup>m</sup>						
$a$	+29.5	+43	+6 35	17 42	249 8	
$a^1$	30.0	+131	+11 45	17 22	248 48	
December 16 0 <sup>h</sup> 35 <sup>m</sup>						
$a^1$	-12.1	-108	-9 10	340 26	281 22	
$a^2$	11.4	-131	-8 51	340 58	282 14	
$a$	9.5	-120	-9 31	342 39	283 55	
December 22 1 <sup>h</sup> 43 <sup>m</sup>						
$a$	-47.1	+224	+7 11	299 44	325 52	
$b$	+34.1	+190	+12 20	10 36	36 44	$a$
December 23 2 <sup>h</sup> 6 <sup>m</sup>						
$a$	+21.4	+229	+13 4	358 15	38 38	
December 31 0 <sup>h</sup> 22 <sup>m</sup>						
$a^1$	+28.7	-187	-12 58	358 48	150 27	
$a^2$	30.2	-224	-15 4	0 31	152 10	
$a^{\text{n}}$	30.4	-240	-16 17	0 53	152 32	$a$
$a^{\text{s}}$		-249				
$a^3$	31.7	-252	-16 40	2 14	153 53	
$a^4$	32.6	-268	-17 34	3 15	154 54	$a^2$
$a^5$	33.9	-224	-14 52	3 59	155 38	
$a^6$	34.3	-252	-16 31	4 43	156 22	
Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$a^7$	+34 <sup>s</sup> .4	-192''	-12° 58'	4° 6'	155° 45'	
$a^8$	36.2	-226	-14 51	6 10	157 50	
$b^{\text{n}}$	32.2	-79	-6 53	1 13	152 52	$b$
$b^{\text{s}}$		-93				
$b^1$	34.3	-87	-6 49	3 8	154 47	
$b^2$	35.3	-101	-7 36	4 9	155 48	$b^1$
$b^3$	37.6	-91	-6 53	6 15	157 54	$b^2$
1866 January 3 1 <sup>h</sup> 54 <sup>m</sup>						
$a^1$	-19.0	-212	-16 1	314 54	149 33	
$a^{\text{n}}$	17.0	-212	-16 19	317 6	151 45	$b$
$a^{\text{s}}$	15.9	-221				
$a^2$	12.8	-235	-17 26	320 12	154 51	
$b$	15.6	-60	-7 6	318 9	152 48	$a$
$b^1$	12.2	-74	-7 46	320 57	155 36	
$b^2$	9.7	-51	-6 34	323 3	157 42	$a^1$
$c$	+65.9	+164	+9 0	40 32	235 11	$c$
January 5 0 <sup>h</sup> 16 <sup>m</sup>						
$a$	-43.1	-71	-6 56	291 14	153 0	$a$
$a^1$	38.6	-64	-6 43	295 42	157 28	
$b$	42.5	-233	-16 28	290 15	152 1	$b$
$b^1$	40.8	-231	-16 25	292 2	153 48	
$c$	+48.5	+204	+9 3	12 41	234 27	$c$
January 7 0 <sup>h</sup> 45 <sup>m</sup>						
$a$	-63.0	-117	-7 29	262 47	152 53	
$b$	60.7	-281	-17 13	262 10	152 16	
$c$	+20.7	+213	+8 18	344 16	234 22	$a$
$c^1$	21.6	+235	+9 38	345 9	235 15	
$c^2$	29.0	+292	+13 6	352 5	242 11	$a^1$
January 9 0 <sup>h</sup> 15 <sup>m</sup>						
$a$	-10.3	+222	+9 13	316 51	234 44	
$a^1$	2.4	+291	+13 4	323 32	241 25	
$b^{\text{n}}$	+61.7	+195	+6 41	27 11	305 4	$b$
$b^{\text{s}}$		+167				
$b^1$	63.1	+136	+4 7	28 59	306 52	
$b^2$	64.1	+149	+5 0	31 7	309 0	$b^1$
January 14 0 <sup>h</sup> 15 <sup>m</sup>						
$a$	-51.8	+7	+0 37	272 34	260 37	
$a^1$	48.8	+18	+0 52	276 6	264 10	
$b^{\text{n}}$	7.3	+192	+6 20	315 33	303 37	$a$
$b^{\text{s}}$	5.0	+173				
$b^1$	1 5	+155	+4 26	319 15	307 19	$a^1$

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1866 January 17 0 <sup>h</sup> 58 <sup>m</sup>						
$a^s$	-56 <sup>s</sup> .5	+ 92''	+ 6° 46'	272° 12'	302° 47'	$a$
$a^n$	48.9	+113				
$a^1$	46.5	+ 64	+ 4 0	275 46	306 21	
$b$	+43.2	- 28	- 9 18	354 52	25 27	$b$
$b^1$	45.8	- 32	- 9 36	357 39	28 14	$b^1$
$b^2$	47.6	- 18	- 8 50	359 40	30 15	$b^2$
$b^3$	53.5	- 41	-10 14	6 49	37 24	$b^3$
$b^4$	54.0	- 25	- 9 0	7 24	37 59	$b^4$
January 18 2 <sup>h</sup> 17 <sup>m</sup>						
$a^s$	-60.7	+ 55	+ 6 41	255 4	300 27	
$a^n$	59.5	+ 71				
$a^1$	58.4	+ 83	+ 7 30	257 45	303 8	
$b$	+28.1	- 39	- 9 33	337 7	22 30	$a_{1a_2}$
$b^1$	30.5	- 34	- 9 24	339 22	24 45	
$b^2$	34.1	- 13	- 8 22	342 45	28 8	
$b^3$	41.3	- 37	-10 7	349 47	35 10	
$b^4$	42.1	- 23	- 9 20	350 41	36 4	$b$
January 22 23 <sup>h</sup> 55 <sup>m</sup>						
$a^1$	-33.1	-136	- 8 38	281 54	22 2	
$a^2$	30.3	-120	- 8 10	284 43	24 51	
$a_1$	31.1	-150	- 9 45	283 31	23 39	$a_1$
$a_2$	29.9	-155	-10 13	284 32	24 40	$a_2$
$b$	16.0	-110	- 9 42	297 27	37 35	$b$
January 23 0 <sup>h</sup> 25 <sup>m</sup>						
$a_1$	-43.7	-192	- 9 44	269 15	23 42	$b_1$
$a_2$	42.6	-192	- 9 56	270 31	24 58	$b_2$
$b$	30.3	-144	- 9 24	283 14	37 41	$b^1$
January 24 23 <sup>h</sup> 56 <sup>m</sup>						
$a$	-57.8	+128	+12 2	254 28	22 40	
$a^1$	55.9	+ 95	+ 9 35	257 17	25 29	
$a^2$	55.3	+122	+11 2	258 10	26 22	
$b_1$	53.4	-222	- 9 4	255 47	23 59	
$b_2$	52.5	-224	- 9 24	256 58	25 10	
$b^1$	42.7	-169	- 8 24	269 38	37 50	
$c$	+65.1	-123	-14 29	245 48	114 0	
January 27 0 <sup>h</sup> 13 <sup>m</sup>						
$a$	-35.3	+229	+13 42	278 14	88 43	
$a^1$	33.1	+256	+14 52	280 34	91 3	
$b$	+66.6	- 7	-12 1	22 47	193 16	$d$
$b^1$	67.2	- 21	-12 43	25 7	195 36	$d^1$
January 31 23 <sup>h</sup> 43 <sup>m</sup>						
$a$	-59 <sup>s</sup> .6	+ 72''	+10° 40'	243° 55'	110° 14'	
$b$	8.3	- 79	- 9 7	294 38	160 57	
$b^1$	5.9	- 75	- 9 20	296 38	162 57	
$c^1$	7.1	+220	+ 7 49	299 21	165 40	
$c$	2.1	+211	+ 6 21	303 24	169 43	
$c^2$	+ 1.8	+186	+ 4 14	306 15	172 34	
$d^n$	28.6	- 39	-13 23	326 34	192 53	$b_1$
$d^s$	31.0	- 37	-13 6	328 53	195 12	$b_2$
February 5 23 <sup>h</sup> 1 <sup>m</sup>						
$a$	-50.7	-296	-10 9	243 17	179 22	
$a^1$	48.2	-287	-10 29	246 54	182 59	
$b_1^n$	39.1	-273	-12 54	257 21	193 26	$a$
$b_1^s$		-291				
$b_2$	38.6	-264	-12 3	258 20	194 25	
$c^1$	+54.5	+368	+ 6 35	358 35	294 40	
$c^n$	54.8	+400	+ 8 2	0 11	296 16	$b$
$c^s$		+382				
February 7 0 <sup>h</sup> 18 <sup>m</sup>						
$a$	-55.1	-382	-12 23	229 56	194 50	
$b^n$	+33.7	+363	+ 7 30	330 44	295 38	$a$
$b^s$		+349				
February 15 23 <sup>h</sup> 50 <sup>m</sup>						
$a^n$	-61.9	-130	+ 6 9	218 38	295 5	$a$
$a^s$		-144				
$b^n$	+ 6.6	+320	+ 9 3	298 23	14 50	$b$
$b^s$		+306				
$c^1$	26.0	+383	+ 8 41	316 52	33 19	$c^1$
$c^2$	27.2	+372	+ 8 2	317 37	34 4	$c^2$
$c^3$	29.0	+394	+ 8 41	320 3	36 30	$c^3$
$c^4$	31.2	+408	+ 9 5	322 36	39 3	$c^4$
$c^5$	32.7	+441	+10 46	325 7	41 44	$c^6$
$c^n$	33.5	+390	+ 6 53	324 50	41 17	$c$
$c^s$	34.9	+372				
$c^6$	35.0	+425	+ 9 22	326 56	43 23	$c^7$
February 16 2 <sup>h</sup> 2 <sup>m</sup>						
$a$	-64.7	-166	+ 6 56	206 35	298 48	
$b$	9.3	+250	+ 9 38	283 2	15 7	$a$
$b^1$	4.4	+337	+13 20	288 46	20 59	
$c^1$	+10.3	+326	+ 8 48	300 45	32 58	$b^2$
$c^2$	11.9	+320	+ 8 3	301 58	34 11	$b^3$
$c^3$	13.2	+351	+ 9 33	303 45	35 58	$b^4$

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1866 February 16—Continued						
$c^4$	+14.9	+358''	+ 9° 33'	305° 22'	37° 35'	$b^5$
$c^5$	18.0	+353	+ 8 31	307 57	40 10	$b^6$
$c^6$	18.5	+407	+11 36	309 40	41 53	$b^7$
$c^n$	19.1	+351	+ 7 25	309 22	41 35	$b$
$c^s$	20.7	+333				
$c^7$	21.6	+392	+ 9 59	312 7	44 20	$b^9$
$c^8$	22.5	+364	+ 8 7	312 12	44 25	$b^{10}$
February 17 1 <sup>h</sup> 2 <sup>m</sup>						
$a$	-22.9	+173	+ 9 18	269 16	14 56	$a$
$b^1$	4.9	+251	+ 8 27	285 48	31 28	
$b^2$	3.6	+265	+ 8 52	287 10	32 50	$b^1$
$b^3$	1.9	+255	+ 7 50	288 20	34 0	$b^2$
$b^4$	0.9	+283	+ 9 10	289 42	35 22	$b^3$
$b^5$	+ 1.7	+292	+ 8 59	292 1	37 41	
$b^6$	4.5	+285	+ 7 50	294 11	39 51	$b_1$
$b^n$	5.3	+297	+ 7 29	295 21	41 1	$b_2$
$b^s$	6.5	+274				
$b^7$	6.5	+342	+10 37	297 2	42 42	$b^4$
$b^8$	8.2	+317	+ 8 43	297 55	43 35	
$b^9$	8.7	+337	+ 9 45	298 44	44 24	$b^5$
$b^{10}$	9.5	+308	+ 7 51	298 49	44 29	$b^6$
February 22 0 <sup>h</sup> 19 <sup>m</sup>						
$a$	-64.4	-161	+ 9 11	199 51	15 16	
$b^1$	59.8	-115	+ 8 26	215 57	31 22	
$b^2$	58.8	-117	+ 7 46	217 58	33 23	
$b^3$	58.3	-100	+ 8 25	219 23	34 48	
$b_1$	56.6	- 80	+ 8 40	222 51	38 16	
$b_2$	55.6	- 85	+ 7 56	224 15	39 40	
$b_3$	55.6	-105	+ 6 52	223 44	39 9	
$b^4$	54.8	- 41	+ 9 58	226 29	41 54	
$b^5$	53.5	- 25	+10 15	228 43	44 8	
$b^6$	52.6	- 46	+ 8 42	229 33	44 58	
February 26 0 <sup>h</sup> 39 <sup>m</sup>						
$a^1$	+36.6	+110	-11 26	310 47	182 32	
$a^2$	37.0	+103	-11 54	311 1	182 46	$b$
$a$	39.7	+119	-11 40	314 15	186 0	$b^1$
February 28 0 <sup>h</sup> 31 <sup>m</sup>						
$a$	-27.0	+175	+11 42	255 15	154 59	
$a^1$	24.2	+213	+12 50	258 27	158 11	
$b$	+10.1	- 13	-11 7	282 2	181 46	$a$
$b^1$	13.7	+ 1	-11 27	285 25	185 9	$a^2$
$c$	49.7	+535	+10 36	341 21	241 5	$b$

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
March 1 2 <sup>h</sup> 54 <sup>m</sup>						
$a^1$	- 6.3	- 69''	- 8° 53'	266° 11'	181° 21'	$a a^1$
$a$	5.1	- 92	-10 32	266 37	181 47	
$a^2$	3.7	- 85	-10 38	267 56	183 6	
$b$	+41.2	+517	+10 34	325 26	240 36	$b^1$
March 2 3 <sup>h</sup> 3 <sup>m</sup>						
$a$	-20.0	-163	- 9 3	251 24	180 32	
$a^1$	19.6	-168	- 9 29	251 39	180 47	
$b$	+30.4	+474	+10 18	310 24	239 32	$a$
$b^1$	31.0	+481	+10 34	311 17	240 25	$a^1$
March 3 2 <sup>h</sup> 2 <sup>m</sup>						
$a$	+19.2	+419	+10 4	297 6	239 50	$a$ $b$
$a^1$	20.0	+425	+10 14	298 0	240 44	
$b$	54.0	+510	+ 8 11	347 51	290 35	
March 6 23 <sup>h</sup> 28 <sup>m</sup>						
$a$	-20.0	-193	+10 27	256 3	239 23	
$a^1$	12.1	-314	+14 22	265 25	248 45	
$b^n$	+30.9	+463	+ 8 33	307 15	290 35	$a$
$b^s$	31.9	+453				
March 8 0 <sup>h</sup> 46 <sup>m</sup>						
$a^n$	+ 4.9	+337	+ 9 5	278 21	290 31	$a$
$a^s$	6.1	+326				
March 10 23 <sup>h</sup> 33 <sup>m</sup>						
$a^n$	-20.9	+168	+ 9 10	251 10	290 41	
$a^s$	19.9	+157				
$a^1$	19.3	+192	+10 22	252 47	292 18	
$a^2$	16.6	+169	+ 8 3	254 29	294 0	
$b$	53.1	+545	+ 9 29	345 31	25 2	$a$
March 17 0 <sup>h</sup> 10 <sup>m</sup>						
$a^1$	-22.9	+107	+ 7 39	240 54	19 1	
$a$	20.2	+163	+ 9 35	244 32	22 39	$a$
$a^2$	17.1	+202	+10 26	248 8	26 15	
$b^n$	+25.6	+491	+10 54	292 22	70 29	$b$
$b^s$		+482				
March 19 2 <sup>h</sup> 33 <sup>m</sup>						
$a$	-43.9	- 30	+ 9 50	215 21	22 56	$a$
$b^1$	3.1	+317	+11 25	260 26	68 1	



Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1866 March 19—Continued						
$b_n$	-1 <sup>s</sup> .1	+333''	+11° 11'	262° 45'	70° 20'	$b$
$s$	0.3	+326				
$b^2$	+1.9	+359	+11 52	265 40	73 15	
March 22 0 <sup>h</sup> 3 <sup>m</sup>						
$a$	-60.8	-234	+9 17	176 51	25 4	A
$b$	37.2	+51	+11 19	221 35	69 48	
$c^1$	+31.7	+489	+8 53	293 51	142 4	
$c$	33.4	+516	+9 57	296 52	145 5	
$c^2$	35.6	+536	+10 30	300 21	148 34	
March 27 23 <sup>h</sup> 19 <sup>m</sup>						
$a$	-34.3	+23	+8 52	218 55	136 52	$a$
$a^1$	33.8	+34	+9 15	219 37	137 34	
$a^2$	30.6	+72	+9 50	223 32	141 29	
$a^3$	29.9	+81	+10 0	224 26	142 23	
$a^4$	29.0	+102	+10 47	225 44	143 41	$a^2$
$b^1$	11.1	-144	-9 50	234 7	152 4	
$b^2$	9.0	-130	-9 59	236 15	154 12	
$b_1$	6.3	-134	-11 15	238 17	156 14	
$b_2$	5.8	-139	-10 53	238 59	156 56	
$b^3$	5.8	-123	-11 44	238 32	156 29	
$b^4$	0.8	-91	-11 12	243 54	161 51	
$c$	+50.6	+582	+10 11	327 8	245 5	
March 30 2 <sup>h</sup> 26 <sup>m</sup>						
$a$	-59.1	-217	+9 29	175 8	137 2	
$a^1$	58.3	-231	+8 18	176 13	138 7	
$a^2$	57.3	-160	+11 11	181 40	143 34	
$b$	+52.0	+549	+7 36	323 7	285 1	$a$
April 2 0 <sup>h</sup> 31 <sup>m</sup>						
$a$	+33.6	+483	+7 56	284 50	287 42	$a$
$a^1$	33.9	+494	+8 29	285 40	288 32	$a^1$
April 3 1 <sup>h</sup> 49 <sup>m</sup>						
$a$	+22.5	+412	+7 42	270 14	287 54	$a$
$a^1$	23.0	+421	+8 0	271 3	288 43	$a^2$
$a^2$	24.3	+435	+8 23	272 42	290 22	
April 4 2 <sup>h</sup> 17 <sup>m</sup>						
$a^1$	+10.2	+303	+6 9	255 18	287 16	$a^1$
$a$	10.2	+333	+7 50	256 12	288 10	$a$
$a^2$	10.9	+347	+8 21	257 9	289 7	
$a^3$	12.5	+328	+6 41	257 56	289 54	

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
April 5 2 <sup>h</sup> 25 <sup>m</sup>						
$a^1$	-3 <sup>s</sup> .6	+203''	+6° 9'	240° 28'	286° 32'	
$a^2$	3.5	+214	+6 41	240 51	286 55	
$a$	2.7	+234	+7 27	242 1	288 5	$a$
$b$	+50.6	+578	+9 42	316 54	2 58	
April 8 0 <sup>h</sup> 44 <sup>m</sup>						
$a$	-38.6	-53	+7 35	200 53	288 5	$a$
$b$	11.4	+318	+15 55	234 28	321 40	$b$
$c$	8.7	+398	+19 26	238 55	326 7	
$c^1$	8.0	+396	+19 0	239 26	326 38	$b^3$
$c^2$	7.0	+391	+18 16	240 9	327 21	
April 9 1 <sup>h</sup> 15 <sup>m</sup>						
$a$	-48.2	-150	+7 7	186 21	287 53	$a$
$b$	24.9	+201	+15 14	219 3	320 35	
$b^1$	22.7	+236	+16 9	221 48	323 20	$b$
$b^2$	22.0	+274	+18 16	223 22	324 54	$b^1$
$b^3$	20.7	+295	+18 44	224 59	326 31	
April 10 1 <sup>h</sup> 20 <sup>m</sup>						
$a$	-55.1	-221	+7 5	172 48	288 25	
$b$	34.9	+131	+15 55	207 9	322 46	
$b^1$	33.7	+182	+18 15	209 27	325 4	
$c$	+45.2	+283	-6 31	282 23	38 0	$a^1$
$c^1$	47.5	+285	-7 5	285 27	41 4	$a^2$
$c^2$	47.7	+271	-7 56	285 16	40 53	$a^3$
April 11 1 <sup>h</sup> 56 <sup>m</sup>						
$a$	+33.3	+218	-6 12	266 15	36 15	$a^1$
$a^1$	35.4	+232	-6 9	268 46	38 46	$a^2$
$a^2$	37.7	+234	-6 47	271 9	41 9	
$a^3$	37.9	+220	-7 37	271 0	41 0	$a$
$b_n$	45.9	+635				
$s$	46.7	+622	+13 56	305 21	75 21	$b$
April 13 0 <sup>h</sup> 23 <sup>m</sup>						
$a^1$	+6.8	+32	-6 30	236 23	33 33	
$a^2$	9.4	+60	-5 59	239 12	36 22	
$a$	14.2	+64	-7 34	243 13	40 23	$a$
$b_n$		+577				
$s$	33.1	+557	+13 50	277 43	74 53	$b$
April 14 0 <sup>h</sup> 19 <sup>m</sup>						
$a$	+1.0	-25	-7 12	229 16	40 25	
$b^1$	22.2	+548	+16 35	264 42	75 51	

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1866 April 14—Continued						
$b_s^n$	+23 <sup>s</sup> .1	+521'' +501	+14° 4'	263° 54'	75° 3'	$b_1 b_2$
$b^2$	24.8	+486	+12 0	264 25	75 34	$b^2$
April 15 3 <sup>h</sup> 2 <sup>m</sup>						
$a$	+ 0.1	+120	+ 0 56	231 22	58 9	
$a^1$	1.2	+ 80	- 1 35	231 4	57 51	
$b^1$	6.9	+426	+15 19	245 34	72 21	
$b_1$	9.9	+411	+13 18	247 32	74 19	$a$
$b_2$	10.3	+431	+14 18	248 32	75 19	$a^4$
$b^2$	11.7	+390	+11 26	248 20	75 7	
April 17 0 <sup>h</sup> 49 <sup>m</sup>						
$a^1$	-16.6	+229	+13 44	218 46	72 19	
$a^2$	16.6	+202	+12 14	218 5	71 38	
$a_s^n$	15.2	+230	+13 14	220 22	73 55	$a$
$a_n$	14.3	+237				
$a^3$	14.9	+301	+17 2	222 2	75 35	$a^1?$
$a^4$	13.9	+271	+15 0	222 3	75 36	$a^2?$
April 20 23 <sup>h</sup> 55 <sup>m</sup>						
$a^1$	-50.0	+ 14	+16 43	178 1	73 9	
$a$	48.9	- 32	+13 37	178 25	73 33	$a$
$a^2$	47.6	- 23	+13 31	180 11	75 19	
April 22 23 <sup>h</sup> 55 <sup>m</sup>						
$a$	-61.4	-155	+13 23	151 20	74 31	
$b$	+45.1	+450	+ 4 31	276 56	200 7	}A
$b^1$	46.5	+467	+ 5 7	279 47	202 58	
April 27 0 <sup>h</sup> 10 <sup>m</sup>						
$a^1$	-22.6	- 5	+ 3 55	198 16	191 46	
$a^2$	19.2	+ 23	+ 4 7	201 48	195 18	
$a$	19.2	+ 14	+ 3 37	201 34	195 4	
$a^3$	17.1	+ 14	+ 2 49	203 17	196 47	
$a^4$	15.8	+ 56	+ 4 36	205 23	198 53	
$a^5$	15.3	+ 35	+ 3 15	205 19	198 49	
$a^6$	14.7	+ 60	+ 4 23	206 23	199 53	
$a^7$	13.5	+ 52	+ 3 31	207 7	200 37	
$a^8$	12.4	+ 65	+ 3 48	208 21	201 51	
May 4 23 <sup>h</sup> 27 <sup>m</sup>						
$a$	-62.7	-156	+12 11	137 31	228 51	
$b$	+48.5	+241	- 4 20	260 23	351 43	

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
May 15 0 <sup>h</sup> 43 <sup>m</sup>						
$a_1$	-53 <sup>s</sup> .3	-370''	- 5° 40'	137° 23'	23° 49'	
$a_2$	52.6	-373	- 6 3	138 16	24 42	
$a^1$	47.7	-377	- 8 1	145 4	31 30	
$a^2$	47.1	-363	- 7 28	146 30	32 56	
$a^3$	47.0	-370	- 7 52	146 17	32 43	
$a^4$	46.0	-336	- 6 23	149 3	35 29	
$b$	+48.6	+408	+ 6 46	255 28	141 54	
May 17 0 <sup>h</sup> 18 <sup>m</sup>						
$a$	+59.8	+113	-12 21	260 21	174 37	$b$
$a^1$	62.4	+159	-10 16	267 13	181 29	$b_3 b_4$
May 19 0 <sup>h</sup> 27 <sup>m</sup>						
$a$	-51.0	-481	-13 30	130 37	73 2	
$b^1$	+38.7	- 14	-13 33	228 31	170 36	$a^1$
$b^2$	40.6	+ 28	-11 38	231 9	173 34	
$b$	40.6	- 3	-13 26	230 39	173 4	$a$
$b^3$	46.7	+ 71	-10 48	238 40	181 5	
$b^4$	47.2	+ 86	-10 4	239 28	181 53	
May 20 1 <sup>h</sup> 0 <sup>m</sup>						
$a^1$	+25.3	- 81	-13 28	213 44	170 31	
$a$	27.8	- 69	-13 29	216 14	173 1	
$a^2$	28.3	- 90	-14 50	216 21	173 8	
$b$	54.5	+469	+10 40	264 1	220 48	$a$
May 24 2 <sup>h</sup> 37 <sup>m</sup>						
$a_s^n$	+13.8	+284 +270	+10 59	207 12	221 3	$a$
May 30 0 <sup>h</sup> 31 <sup>m</sup>						
$a_s^n$	-59.7	- 16 - 23	+12 29	125 3	221 53	
June 1 0 <sup>h</sup> 33 <sup>m</sup>						
$a_s^n$	+62.9	+161 +143	- 5 12	251 32	16 28	$a$
$a^1$	63.5	+120	- 7 12	252 0	16 56	
$a^2$	63.7	+147	- 5 40	253 22	18 18	$a^1$
June 5 3 <sup>h</sup> 16 <sup>m</sup>						
$a_s^n$	+16.4 17.4	- 12 - 30	- 4 26	192 34	15 13	$a$

Letter	<i>4a</i>	<i>4δ</i>	<i>b</i>	<i>L</i>	<i>L'</i>	Letter on next date
1866 June 5—Continued						
<i>a</i> <sup>1</sup>	+18.8	— 28''	— 51° 4'	194° 5'	16° 44'	<i>a</i> <sup>2</sup>
<i>a</i> <sup>2</sup>	19.9	0	— 3 48	195 21	18 0	<i>a</i> <sup>3</sup>
<i>a</i> <sup>3</sup>	19.9	— 25	— 5 16	195 1	17 40	
<i>a</i> <sup>4</sup>	21.4	+ 7	— 3 42	196 46	19 25	
June 8 3 <sup>h</sup> 16 <sup>m</sup>						
<i>a</i> <sup>n</sup>	—28.9	—162				<i>a</i>
<i>a</i> <sub>s</sub>	28.0	—181	— 4 26	149 56	14 41	
<i>a</i> <sup>1</sup>	28.7	—217	— 7 10	148 54	13 39	
<i>a</i> <sup>2</sup>	26.4	—169	— 4 44	151 49	16 34	<i>a</i> <sup>1</sup>
<i>a</i> <sup>3</sup>	25.5	—153	— 3 57	152 53	17 38	
June 10 0 <sup>h</sup> 15 <sup>m</sup>						
<i>a</i> <sup>n</sup>	—51.2	—226				<i>a</i>
<i>a</i> <sub>s</sub>		—245	— 4 50	123 10	14 14	
<i>a</i> <sup>1</sup>	49.3	—236	— 5 8	125 35	16 38	
June 12 1 <sup>h</sup> 7 <sup>m</sup>						
<i>a</i>	—64.6	—263	— 5 16	95 4	14 42	
June 16 1 <sup>h</sup> 4 <sup>m</sup>						
<i>a</i> <sup>n</sup>	+27.6	—136	—10 45	190 51	166 35	<i>a</i>
<i>a</i> <sub>s</sub>		—146				
<i>a</i> <sup>1</sup>	28.9	—154	—11 44	191 56	167 40	
<i>a</i> <sup>2</sup>	29.7	—129	—10 20	192 51	168 35	<i>a</i> <sup>2</sup>
<i>a</i> <sup>3</sup>	30.9	—163	—12 35	193 45	169 29	
<i>a</i> <sup>4</sup>	31.4	—133	—10 50	194 25	170 9	<i>a</i> <sup>3</sup>
June 18 2 <sup>h</sup> 11 <sup>m</sup>						
<i>a</i> <sup>1</sup>	— 6.9	—263	—13 21	158 40	163 7	
<i>a</i>	4.1	—216	—11 47	161 27	165 54	<i>a</i>
<i>a</i> <sup>2</sup>	0.4	—214	—11 8	164 34	169 1	<i>a</i> <sup>2</sup>
<i>a</i> <sup>3</sup>	+ 0.8	—213	—11 12	165 32	169 59	
<i>a</i> <sup>4</sup>	0.9	—232	—12 22	165 27	169 54	<i>a</i> <sup>3</sup>
June 20 0 <sup>h</sup> 36 <sup>m</sup>						
<i>a</i> <sup>n</sup>	—33.2	—245	—10 0	133 41	165 17	<i>a</i>
<i>a</i> <sub>s</sub>		—261				
<i>a</i> <sup>1</sup>	30.3	—287	—12 22	136 1	167 37	
<i>a</i> <sup>2</sup>	29.4	—275	—11 43	137 3	168 39	
<i>a</i> <sup>3</sup>	27.6	—291	—12 53	138 31	170 7	
Letter	<i>4a</i>	<i>4δ</i>	<i>b</i>	<i>L</i>	<i>L'</i>	Letter on next date
June 23 0 <sup>h</sup> 39 <sup>m</sup>						
<i>a</i>	—62.1	—256''	— 9° 11'	92° 53'	166° 37'	
<i>b</i>	41.5	—210	— 7 15	123 29	197 13	<i>a</i>
<i>b</i> <sup>1</sup>	40.5	—206	— 7 4	124 32	198 16	
<i>b</i> <sup>2</sup>	39.0	—196	— 6 33	126 13	199 57	
<i>b</i> <sup>3</sup>	39.0	—215	— 7 42	125 58	199 42	<i>a</i> <sup>1</sup> ?
<i>b</i> <sup>4</sup> <sub>n</sub>	37.0	—208				<i>a</i> <sup>2</sup>
<i>b</i> <sub>s</sub>	36.1	—224	— 7 56	128 27	202 11	
June 25 0 <sup>h</sup> 55 <sup>m</sup>						
<i>a</i>	—61.6	—200	— 6 27	94 14	196 11	
<i>a</i> <sup>1</sup>	60.9	—204	— 6 42	95 35	197 32	
<i>a</i> <sup>2</sup>	57.4	—219	— 7 39	101 20	203 17	
June 28 2 <sup>h</sup> 56 <sup>m</sup>						
<i>a</i>	—58.5	—297	—13 37	94 13	239 27	
<i>a</i> <sup>1</sup>	58.4	—271	—11 57	95 27	240 41	
<i>b</i> <sup>1</sup>	+43.5	+173	+10 13	197 48	343 2	<i>a</i> <sup>1</sup>
<i>b</i> <sup>2</sup>	44.2	+183	+10 46	198 43	343 57	<i>a</i> <sup>2</sup>
<i>b</i>	46.6	+171	+ 9 49	201 20	346 34	<i>a</i>
<i>c</i>	63.9	— 51	— 5 28	224 53	10 7	<i>b</i>
June 30 3 <sup>h</sup> 41 <sup>m</sup>						
<i>a</i> <sup>1</sup>	+15.2	+130	+10 10	168 36	342 20	
<i>a</i> <sup>2</sup>	16.0	+132	+10 15	169 22	343 6	
<i>a</i> <sup>3</sup>	18.3	+140	+ 9 38	171 21	345 5	
<i>a</i>	19.6	+119	+ 9 21	172 24	346 8	<i>a</i> <sup>1</sup> <i>a</i> <sup>2</sup>
<i>a</i> <sup>4</sup>	20.5	+119	+ 9 13	173 10	347 54	
<i>b</i> <sub>n</sub>	45.3	— 93	— 5 32	196 9	9 53	<i>b</i> <sub>1</sub>
<i>b</i> <sub>s</sub>		—105				
<i>b</i> <sup>1</sup>	49.2	—110	— 6 31	200 37	14 21	<i>b</i> <sup>1</sup>
<i>b</i> <sup>2</sup>	49.8	—105	— 6 16	201 22	15 6	
<i>b</i> <sup>3</sup>	52.7	— 88	— 5 30	204 56	18 40	
July 3 0 <sup>h</sup> 6 <sup>m</sup>						
<i>a</i> <sup>1</sup>	—25.1	+ 74	+ 8 7	131 15	345 0	
<i>a</i> <sup>2</sup> <sub>Nov. 1</sub>	24.9	+ 81	+ 8 32	131 24	345 9	
<i>b</i> <sub>1</sub>	+ 3.7	—129	— 4 31	155 29	9 14	<i>a</i>
<i>b</i> <sub>2</sub>	4.5	—134	— 4 50	156 10	9 55	
<i>b</i> <sup>1</sup>	7.6	—160	— 6 30	158 45	12 30	
<i>b</i> <sup>2</sup>	8.4	—171	— 7 12	159 24	13 9	
July 5 2 <sup>h</sup> 55 <sup>m</sup>						
<i>a</i> <sup>1</sup>	—31.0	—132	— 4 33	123 42	7 10	
<i>a</i> <sup>2</sup>	30.2	—111	— 3 16	124 30	7 58	
<i>a</i>	29.4	—130	— 4 26	125 12	8 40	<i>a</i>
<i>a</i> <sup>3</sup>	28.3	—144	— 5 14	126 10	9 38	



Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1866 July 9 1 <sup>h</sup> 46 <sup>m</sup>						
a	-66.6	- 76''	- 4° 56'	69° 55'	8° 50'	
July 12 0 <sup>h</sup> 30 <sup>m</sup>						
a	+60.8	-178	- 6 43	208 39	188 57	a
July 15 1 <sup>h</sup> 24 <sup>m</sup>						
a <sub>s</sub>	+26.3	-209	- 6 37	165 13	188 8	a
a <sub>n</sub>	27.1	-199				
July 17 0 <sup>h</sup> 52 <sup>m</sup>						
a <sub>n</sub>	- 3.8	-176	- 6 28	137 23	188 4	a
a <sub>s</sub>	3.0	-188				
b	+17.0	-162	- 3 56	154 34	205 15	
b <sup>1</sup>	19.5	-165	- 4 0	156 45	207 26	
July 19 1 <sup>h</sup> 13 <sup>m</sup>						
a <sub>n</sub>	-33.6	-123	- 6 16	108 57	187 53	
a <sub>s</sub>	32.9	-135				
August 5 23 <sup>h</sup> 59 <sup>m</sup>						
a	+34.2	- 25	+10 26	152 38	109 26	a
a <sup>1</sup>	35.1	- 39	+10 9	157 9	113 57	a <sup>3</sup>
August 10 3 <sup>h</sup> 9 <sup>m</sup>						
a <sub>n</sub>	-38.3	+196	+ 7 54	78 34	107 23	
a <sub>s</sub>	37.5	+184				
a <sup>1</sup>	36.6	+188	+ 8 9	79 55	108 44	
a <sup>2</sup>	35.5	+214	+ 9 56	80 23	109 12	
a <sup>3</sup>	31.0	+191	+ 9 55	85 27	114 16	
August 16 22 <sup>h</sup> 20 <sup>m</sup>						
a <sup>1</sup>	+35.7	-125	+ 7 23	144 53	255 6	} a
a	36.3	-128	+ 7 20	145 33	255 46	
a <sup>2</sup>	37.1	-141	+ 6 42	146 36	256 49	
a <sup>3</sup>	38.8	-114	+ 8 35	147 59	258 12	
a <sup>4</sup>	39.4	-151	+ 6 31	149 12	259 25	
a <sup>5</sup>	39.9	-128	+ 7 55	149 25	259 35	a <sup>5</sup>
August 17 2 <sup>h</sup> 16 <sup>m</sup>						
a	+19.3	- 65	+ 8 41	127 10	253 43	
a <sup>1</sup>	20.0	- 79	+ 7 5	128 2	254 35	
Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
a <sup>2</sup>	+20.8	- 55''	+ 8° 40'	128° 22'	254° 55'	a <sup>2</sup>
a <sup>3</sup>	23.2	- 72	+ 8 12	130 49	257 22	a <sup>3</sup>
a <sup>4</sup>	25.6	-113	+ 6 19	133 37	260 10	a <sup>4</sup>
a <sup>5</sup>	25.6	- 81	+ 8 11	133 6	259 39	
August 20 22 <sup>h</sup> 46 <sup>m</sup>						
a <sup>1</sup>	-22.9	+129	+ 7 37	84 33	251 9	b <sup>1</sup> ?
a	22.5	+167	+ 9 50	83 57	250 33	b
a <sup>2</sup>	21.9	+132	+ 8 6	85 23	251 59	
a <sup>3</sup>	18.9	+111	+ 7 50	88 30	255 6	
a <sup>4</sup>	16.5	+ 81	+ 6 52	91 10	257 46	b <sup>2</sup>
August 22 1 <sup>h</sup> 58 <sup>m</sup>						
a	-58.7	+374	+ 5 56	24 13	220 46	
b <sup>1</sup>	46.4	+270	+ 6 46	54 14	250 46	
b	45.9	+318	+ 9 32	53 0	249 32	a
b <sup>2</sup>	41.8	+233	+ 6 33	61 0	257 32	
August 24 2 <sup>h</sup> 48 <sup>m</sup>						
a	-55.8	+430	+ 9 46	25 40	250 46	
b <sub>s</sub>	+55.4	-144	+12 12	163 54	29 0	a
b <sub>n</sub>	56.2	-123				
August 27 0 <sup>h</sup> 17 <sup>m</sup>						
a <sub>n</sub>	+25.2	- 21	+12 33	123 7	28 51	a
a <sub>s</sub>	26.5	- 46				
August 28 1 <sup>h</sup> 23 <sup>m</sup>						
a <sub>n</sub>	+10.9	+ 35	+11 59	108 14	28 38	a
a <sub>s</sub>	12.5	+ 12				
August 30 0 <sup>h</sup> 6 <sup>m</sup>						
a <sub>n</sub>	-15.5	+196	+12 30	80 9	27 52	a
a <sub>s</sub>	14.2	+172				
September 1 23 <sup>h</sup> 58 <sup>m</sup>						
a <sub>s</sub>	-38.2	+336	+12 20	51 33	27 15	a
a <sub>n</sub>	36.9	+354				
September 2 2 <sup>h</sup> 15 <sup>m</sup>						
a <sub>s</sub>	-46.8	+417	+12 27	35 38	26 43	a
a <sub>n</sub>	45.7	+437				

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1866 September 4 0 <sup>h</sup> 4 <sup>m</sup>						
$a_n$	-53 <sup>s</sup> .1 52.3	+509'' +528	+12° 24'	11° 46'	29° 40'	$a$
September 22 22 <sup>h</sup> 39 <sup>m</sup>						
$a_n$	+38.6 39.8	-151 -133	+12 50	113 23	22 51	$a$
September 24 23 <sup>h</sup> 31 <sup>m</sup>						
$a_n$	+14.6 15.7 18.4	+ 23 + 2 + 9	+13 15 +14 16	84 37 87 34	22 50 25 47	$a$
September 27 22 <sup>h</sup> 35 <sup>m</sup>						
$a_n$	-21.9 20.9	+302 +318	+14 20	42 36	22 23	$a$
September 29 23 <sup>h</sup> 18 <sup>m</sup>						
$a_n$	-40.5 39.5	+462 +473	+13 27	15 9	23 25	$a$
$b$	+35.5 37.1	-471 -512	- 6 36 - 8 33	112 59 116 44	121 15 125 0	$b$
$b^1$	37.1	-512	- 8 33	116 44	125 0	$b^2$
$b^2$	37.8	-504	- 8 2	117 22	125 38	$b^3$
$b^3$	38.7	-492	- 6 54	117 42	125 58	$b^4$
September 30 0 <sup>h</sup> 58 <sup>m</sup>						
$a_n$	-46.5 45.8	+532 +544	+13 24	0 30	23 47	$a$
$b$	+23.1 24.0	-392 -408	- 6 9 - 6 45	96 35 97 59	119 52 121 16	$b$
$b^1$	24.0	-408	- 6 45	97 59	121 16	$b^2$
$b^2$	26.1	-451	- 8 30	101 27	124 44	$b^3$
$b^3$	26.9	-449	- 8 5	102 11	125 28	$b^4$
$b^4$	28.4	-431	- 6 34	102 54	126 11	$b^5$
October 1 1 <sup>h</sup> 50 <sup>m</sup>						
$a$	-49.0 + 9.4	+589 -304	+13 36 - 6 13	347 4 81 7	24 53 118 56	$a$
$b^1$	9.9	-306	- 6 7	81 35	119 24	$a^1$
$b^2$	13.0	-359	- 7 56	85 42	123 31	$a^2$
$b^3$	16.1	-354	- 6 30	88 12	126 1	$a^3$
October 3 2 <sup>h</sup> 19 <sup>m</sup>						
$a$	-18.5 17.9 10.6	- 95 -102 -169	- 6 1 - 6 9 - 6 32	51 6 51 47 59 18	117 16 117 57 125 28	$a_1$ $a_2$ $a^1$
October 5 22 <sup>h</sup> 26 <sup>m</sup>						
$a_1$	-40 <sup>s</sup> .7 40.2 34.8	+ 88'' + 81 - 7	- 6° 22' - 6 29 - 8 36	24° 13' 24 56 32 44	116° 11' 116 54 124 42	$a$ $a^1$
October 6 0 <sup>h</sup> 30 <sup>m</sup>						
$a$	-50.6 49.9	+200 +186	- 5 35 - 5 55	7 51 9 20	115 4 116 33	$a$
October 7 0 <sup>h</sup> 21 <sup>m</sup>						
$a$	-56.8	+270	- 5 34	353 39	114 48	
October 13 22 <sup>h</sup> 50 <sup>m</sup>						
$a$	+53.1	-542	- 7 0	134 11	338 39	$a$
October 14 0 <sup>h</sup> 9 <sup>m</sup>						
$a$	+49.0	-525	- 6 27	119 13	338 30	$a$
October 15 0 <sup>h</sup> 39 <sup>m</sup>						
$a$	+42.1	-493	- 6 23	105 23	338 59	$a$
October 16 0 <sup>h</sup> 18 <sup>m</sup>						
$a$	+33.0 41.9 42.4 43.3 62.7	-439 -277 -287 -293 -217	- 6 15 + 5 36 + 5 12 + 5 10 +13 56	91 27 95 1 96 2 97 20 131 28	338 53 342 27 343 28 344 46 18 54	$a$ $b$
October 18 0 <sup>h</sup> 35 <sup>m</sup>						
$a_n$	+ 0.8 52.6	-264 -271 -174 -162	- 5 32 +14 37	62 34 103 46	338 14 19 26	$a_1 a_2$ $c$
October 19 0 <sup>h</sup> 26 <sup>m</sup>						
$a_1$	- 4.7 4.4 +15.0 17.1 43.9	-180 -190 -116 -121 -125 -134	- 6 1 - 6 27 + 5 35 + 5 17 +14 3	48 36 49 5 62 30 64 20 90 14	338 13 338 42 352 7 353 57 19 51	$a_1$ $a_2$ $b^2$ $b^3$ $c$

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1866 October 20 0 <sup>h</sup> 31 <sup>m</sup>						
$a_1$	-18.4	- 72''	- 5° 44'	33° 56'	337° 38'	$a_1$
$a_2$	18.4	- 77	- 5 57	34 4	337 46	$a_2$
$a^1$	10.1	- 93	- 3 31	41 8	344 50	$a^1$
$b^1$	0 5	0	+ 5 6	46 12	349 54	$b^1$
$b^2$	+ 0.9	+ 5	+ 5 52	47 7	350 49	
$b^3$	2.2	- 14	+ 5 22	48 38	352 20	$b^2$
$b$	3.8	- 16	+ 5 51	49 56	353 38	$b$
$c$ n	33.2	- 37	+ 15 13	76 12	19 54	$c$
$c$ s	34.0	- 49				
October 21 0 <sup>h</sup> 36 <sup>m</sup>						
$a_1$	-31.3	+ 23	- 6 5	19 35	337 22	$a_1$
$a_2$	31.1	+ 16	- 6 22	19 56	337 43	$a_2$
$a^1$	23.1	0	- 3 53	27 14	345 1	
$b^1$	14.1	+ 102	+ 5 5	31 47	349 34	
$b^2$	10.7	+ 72	+ 5 22	35 20	353 7	$b^2$
$b$	9.4	+ 79	+ 5 45	36 11	353 58	$b$
$c$ n	+21.2	+ 39	+ 15 4	62 21	20 8	$c$
$c$ s	22.1	+ 30				
October 22 0 <sup>h</sup> 47 <sup>m</sup>						
$a_1$	-42.6	+ 116	- 6 5	5 13	337 8	$a$
$a_2$	42.6	+ 111	- 6 21	5 22	337 17	
$b^1$	22.0	+ 186	+ 6 15	22 0	353 55	
$b$	21.4	+ 188	+ 6 36	22 25	354 20	
$c$ n	+ 8.2	+ 135	+ 15 13	48 5	20 0	$b$
$c$ s	9.0	+ 123				
October 23 0 <sup>h</sup> 41 <sup>m</sup>						
$a$	-51.6	+ 192	- 6 16	351 15	337 9	
$b$ n	4.6	+ 228				
$b$ s	3.9	+ 216	+ 15 10	34 15	20 9	$a$
October 27 0 <sup>h</sup> 29 <sup>m</sup>						
$a$	-44.8	+ 550	+ 15 6	337 53	19 48	$a$
October 28 0 <sup>h</sup> 34 <sup>m</sup>						
$a$	-49.3	+ 583	+ 14 32	325 56	21 56	
$b_1$	+ 9.3	- 209	- 3 19	51 8	107 8	$a^1$
$b_2$	9.5	- 202	- 2 52	51 9	107 19	$a^2$
$b^1$	10.6	- 223	- 3 36	52 34	108 34	$a^3$
$b^2$	11.8	- 209	- 2 24	53 8	109 8	$a$
$b^3$	13.5	- 232	- 3 5	55 6	111 6	
$b^4$	15.3	- 230	- 2 20	56 33	112 33	
$b^5$	15.4	- 214	- 1 26	56 11	112 11	
November 1 0 <sup>h</sup> 3 <sup>m</sup>						
$a^1$	-42.7	+ 155''	- 3° 43'	354° 31'	106° 21'	
$a^2$	42.3	+ 167	- 2 56	354 31	106 21	
$a^3$	41.5	+ 141	- 3 57	356 8	107 58	
$a$	39.2	+ 164	- 1 51	357 44	109 34	
November 25 0 <sup>h</sup> 27 <sup>m</sup>						
$a$	-13.0	+ 270	+ 13 6	354 50	83 43	
$a^1$	12.6	+ 315	+ 15 42	354 15	83 8	
$b$	2.0	+ 19	+ 1 53	8 41	97 34	$a$
$b^1$	0.8	+ 15	+ 1 58	9 39	98 32	
$c$	+29.6	+ 71	+ 12 47	33 23	122 16	$b$
$c^1$	33.6	+ 45	+ 12 20	37 26	126 19	
$c^2$	34.9	+ 55	+ 13 14	38 29	127 22	$b^1$
November 26 0 <sup>h</sup> 51 <sup>m</sup>						
$a$	-17.4	+ 85	+ 1 33	354 19	97 28	
$a^1$	15.5	+ 81	+ 1 48	355 58	99 7	
$a^2$	14.9	+ 71	+ 1 24	356 35	99 44	
$b$	+15.2	+ 132	+ 12 24	19 17	122 25	
$b^1$	20.7	+ 118	+ 12 59	24 4	127 13	
$c$	29.7	+ 33	+ 10 25	33 6	136 15	
1867 January 2 2 <sup>h</sup> 2 <sup>m</sup>						
$a^1$	-55.7	+ 160	+ 6 18	279 52	182 58	
$a$	53.0	+ 174	+ 7 1	283 13	186 19	
$a^2$	51.0	+ 180	+ 7 18	285 35	188 41	
March 14 0 <sup>h</sup> 48 <sup>m</sup>						
$a$	+11.6	+ 765	+ 34 15	296 28	115 16	$a$
$a^1$	14.7	+ 775	+ 33 49	300 27	119 15	
March 19 0 <sup>h</sup> 41 <sup>m</sup>						
$a$	-42.2	+ 389	+ 33 53	224 54	113 48	
$b^1$	+28.2	+ 130	- 9 59	282 21	171 15	$a^1$
$b^2$	29.7	+ 150	- 9 22	284 16	173 10	
$b$	33.4	+ 162	- 9 54	288 11	177 5	$a$
March 20 0 <sup>h</sup> 14 <sup>m</sup>						
$a^1$	+14.7	+ 37	- 10 24	267 7	169 47	$a^1$
$a^2$	15.4	+ 51	- 9 54	268 3	170 43	$a^2$
$a$	21.5	+ 88	- 10 1	274 14	176 54	$a^4$



Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1867 March 22 0 <sup>h</sup> 48 <sup>m</sup>						
$a^1$	-12.8	-157"	-10° 8'	237° 32'	168° 36'	$a^2$
$a^2$	12.0	-150	-10 5	238 24	169 28	$a^3$
$a$	8.0	-118	-10 2	242 36	173 40	$a^5$
$a^3$	6.8	-125	-10 53	243 22	174 26	
$a^4$	5.5	-104	-10 17	245 0	176 4	
March 24 0 <sup>h</sup> 43 <sup>m</sup>						
$a^1$	-36.2	-340	- 9 13	208 32	167 37	$a$
$a^2$	35.7	-350	- 9 56	208 33	167 38	
$a^3$	35.1	-336	- 9 32	209 47	168 52	
$a^4$	32.5	-299	- 8 51	213 47	172 52	
$a^5$	31.8	-329	-10 42	213 17	172 22	
$a^6$	31.0	-322	-10 41	214 16	173 21	
$a$	30.3	-328	-11 19	214 42	173 47	$a^2$
March 26 0 <sup>h</sup> 38 <sup>m</sup>						
$a$	-49.7	-487	- 9 12	180 40	167 46	
$a^1$	47.6	-489	-10 30	184 8	171 14	
$a^2$	46.2	-480	-10 53	187 5	174 11	
March 30 0 <sup>h</sup> 32 <sup>m</sup>						
$a$	+ 2.3	-449	-31 56	232 24	275 35	
$a^1$	4.2	-434	-31 56	234 40	277 51	
$a^2$	6.8	-427	-32 40	237 15	280 26	
April 3 23 <sup>h</sup> 59 <sup>m</sup>						
$a$	+ 6.2	+328	+ 9 1	254 4	353 4	A
$a^1$	8.5	+319	+ 7 38	255 40	354 40	
$a^2$	9.1	+342	+ 8 41	256 51	355 51	
$a^3$	11.1	+333	+ 7 24	258 16	357 16	
$a^4$	12.5	+337	+ 7 6	259 32	358 32	
April 9 0 <sup>h</sup> 21 <sup>m</sup>						
$a^1$	-58.9	-268	+ 7 6	163 29	346 54	
$a^2$	57.9	-222	+ 8 43	168 27	351 52	
$a$	57.4	-233	+ 7 51	169 1	352 26	
$a^3$	55.7	-226	+ 7 13	172 39	356 4	
April 19 0 <sup>h</sup> 10 <sup>m</sup>						
$a$	-53.6	-466	- 6 1	151 49	115 28	
May 23 0 <sup>h</sup> 21 <sup>m</sup>						
$a$	+44.1	+357	+ 7 31	239 28	320 23	$a$

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
May 24 0 <sup>h</sup> 33 <sup>m</sup>						
$a$	+33.2	+302"	+ 7° 11'	224° 27'	319° 31'	$a$
$b^1$	61.3	-146	-25 56	254 50	349 54	$b$
$b^2$	61.8	-137	-25 29	255 49	350 53	
$b^3$	62.4	-149	-26 23	257 31	352 35	$b^1$
$b$	63.3	-139	-25 58	259 42	354 46	$b^2$
May 25 0 <sup>h</sup> 55 <sup>m</sup>						
$a$	+20.0	+242	+ 7 30	210 57	320 16	a
$b$	54.0	-173	-25 24	240 29	349 48	
$b^1$	54.8	-176	-25 48	241 46	351 4	
$b^2$	57.1	-167	-25 48	245 29	354 48	
$b^3$	57.7	-164	-25 47	246 38	355 56	
May 27 0 <sup>h</sup> 49 <sup>m</sup>						
$a^s$	+31.6	-276	-24 58	211 46	349 5	$a$
$a^n$	32.7	-260				
$a^1$	38.1	-275	-26 59	218 2	355 21	
$a^2$	38.5	-258	-26 0	218 32	355 51	$a^1$
$a^3$	39.9	-263	-26 41	220 6	357 25	$a^2$
May 29 0 <sup>h</sup> 31 <sup>m</sup>						
$a$	+ 5.2	-382	-24 46	183 49	349 2	$a_1$
	6.1					
$a^1$	12.4	-366	-25 32	190 9	355 22	
$a^2$	13.9	-375	-26 29	191 22	356 35	$a^2$
May 31 0 <sup>h</sup> 26 <sup>m</sup>						
$a_1$	-19.7	-486	-24 48	156 58	350 12	a
$a_2$	19.0	-486	-24 58	157 37	350 51	
$a^1$	17.6	-473	-24 30	159 22	352 36	
$a^2$	12.7	-481	-26 13	163 32	356 46	
June 3 0 <sup>h</sup> 41 <sup>m</sup>						
$a^n$	-47.4	-578	-24 51	116 49	352 18	$a$
$a_s$	46.8	-587				
June 4 0 <sup>h</sup> 50 <sup>m</sup>						
$a^n$	-51.2	-595	-25 18	104 19	353 55	
$a_s$		-603				
July 1 0 <sup>h</sup> 19 <sup>m</sup>						
$a^n$	-18.5	+390	+27 27	138 49	47 2	$a$
$a_s$	17.7	+378				

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1867 July 1—Continued						
$a^1$	-17.1	+401"	+28° 33'	139° 41'	47° 54'	A
$a^2$	15.8	+426	+30 12	140 47	49 0	
$a^3$	14.0	+430	+30 25	142 33	50 46	
$a^4$	13.1	+433	+30 35	143 25	51 38	
July 3 22 <sup>h</sup> 43 <sup>m</sup>						
$a_s^n$	-41.1	+370 +360	+26 8	112 19	47 41	a
$a^1$	36.6	+408	+29 2	116 34	51 55	A <sup>1</sup>
$a^2$	34.7	+431	+30 35	118 14	53 35	
$a^3$	34.2	+438	+31 4	118 36	53 57	
$a^4$	34.0	+445	+31 32	118 41	54 2	
b	+26.6	-509	-30 5	178 16	113 37	
b <sup>1</sup>	28.4	-498	-29 23	180 2	115 23	
July 4 0 <sup>h</sup> 54 <sup>m</sup>						
a	-50.9	+379	+26 25	97 7	47 47	a
a <sup>1</sup>	44.6	+449	+31 18	103 38	54 18	
July 6 2 <sup>h</sup> 0 <sup>m</sup>						
a	-60.7	+409	+26 19	69 45	49 7	
July 13 0 <sup>h</sup> 53 <sup>m</sup>						
a	+44.7	-258	-10 33	186 3	263 0	a
July 15 0 <sup>h</sup> 3 <sup>m</sup>						
a	+16.5	-263	-10 39	156 47	261 19	a
July 16 0 <sup>h</sup> 58 <sup>m</sup>						
a	+0.4	-251	-10 35	141 57	261 3	
a <sup>1</sup>	3.9	-271	-11 37	145 5	264 11	
August 18 0 <sup>h</sup> 31 <sup>m</sup>						
$a_s^n$	-33.6	-311 -323	-21 45	83 56	305 54	a
a <sup>1</sup>	28.9	-348	-22 9	89 3	311 1	a <sup>2</sup>
a <sup>2</sup>	28.4	-329	-20 45	89 20	311 18	a <sup>4</sup>
b	+26.5	+293	+30 50	128 56	350 54	
b <sup>1</sup>	33.2	+274	+31 14	136 41	358 39	

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
August 19 2 <sup>h</sup> 4 <sup>m</sup>						
$a_s^n$	+45.7	-234" -242	-21° 23'	68° 28'	305° 22'	
a <sup>1</sup>	44.6	-238	-20 58	69 48	306 42	
a <sup>2</sup>	41.7	-267	-21 41	73 31	310 27	
a <sup>3</sup>	40.7	-274	-21 45	74 45	311 39	
a <sup>4</sup>	40.6	-259	-20 45	74 48	311 42	
September 7 0 <sup>h</sup> 26 <sup>m</sup>						
a	-38.0	+630	+25 38	26 59	169 35	
September 8 2 <sup>h</sup> 34 <sup>m</sup>						
b	+61.4	-229	+10 2	169 32	327 24	a
September 9 0 <sup>h</sup> 43 <sup>m</sup>						
$a_s^n$	+57.6	-244 -226	+10 1	156 31	327 21	a <sub>1</sub>
a <sup>1</sup>	58.5	-242	+9 38	159 8	329 58	
a <sup>2</sup>	59.1	-260	+8 32	161 47	332 37	a <sup>1</sup>
a <sup>3</sup>	60.5	-217	+11 9	164 10	335 0	a <sup>5</sup>
September 11 0 <sup>h</sup> 56 <sup>m</sup>						
$a_s^n$	+40.8	-186 -198	+9 39	128 14	327 16	A
$a_1^n$	42.1	-186 -198	+9 57	129 37	328 39	
$a_2^n$	42.6	-189	+10 18	130 23	329 25	
$a_3$	43.3	-234	+8 4	133 20	332 22	
a <sup>1</sup>	44.8	-200	+10 33	135 20	334 22	
a <sup>2</sup>	47.0	-175	+11 59	134 43	333 45	a <sup>2</sup>
a <sup>3</sup>	47.0	-207	+10 17	136 20	335 22	a <sup>3</sup>
a <sup>4</sup>	47.8	-195	+11 3	136 30	335 32	a <sup>4</sup>
a <sup>5</sup>	47.9	-193	+11 17	137 8	336 10	
a <sup>6</sup>	48.4					
September 12 0 <sup>h</sup> 49 <sup>m</sup>						
$a_s^n$	+30.1	-130 -151	+9 44	114 57	327 56	a
a <sup>1</sup>	31.9	-182	+8 59	121 29	334 28	a <sup>5</sup>
a <sup>2</sup>	36.5	-127	+11 52	120 50	333 49	a <sup>6</sup>
a <sup>3</sup>	37.1	-173	+9 45	122 2	335 1	a <sup>7</sup>
a <sup>4</sup>	37.4	-148	+11 28	122 53	335 52	a <sup>8</sup>

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1867 September 13 0 <sup>h</sup> 34 <sup>m</sup>						
$a^1$	+14 <sup>s</sup> 8	- 51''	+ 9° 35'	96° 53'	323° 45'	
$a^2$	16.2	- 55	+ 9 50	98 21	325 13	$a^4$
$a^{\text{n}}$	18.1	- 53	+10 4	101 9	328 1	$a$
$a^{\text{s}}$	20.0	- 83				
$a^3$	18.5	- 21	+12 29	99 37	326 29	$a^5$
$a^4$	20.7	- 41	+12 6	101 59	328 51	$a^8$
$a^5$	25.0	-113	+ 9 29	107 30	334 22	$a^9$
$a^6$	25.7	- 64	+12 27	107 7	333 59	$a^{10}$
$a^7$	26.2	-111	+ 9 59	108 37	335 29	$a^{11}$
$a^{\text{s}}$		- 90				
$a^{\text{n}}$	27.4	- 76	+11 55	109 7	335 59	$a^{12}$
September 14 0 <sup>h</sup> 42 <sup>m</sup>						
$a^1$	- 0.3	+ 39	+ 9 12	81 19	322 19	$a^1$
$a^2$	+ 0.9	+ 54	+10 25	81 51	322 51	$a^3$
$a^3$	1.5	+ 7	+ 8 6	83 32	324 32	
$a^4$	3.1	+ 28	+ 9 50	84 21	325 21	
$a^5$	4.5	+ 60	+12 4	84 44	325 44	$a^5$
$a^6$	6.0	+ 67	+12 59	85 46	326 46	
$a^7$	6.2	- 32	+ 7 41	88 22	329 22	
$a^{\text{n}}$	5.5	+ 21	+10 0	87 44	328 44	$a$
$a^{\text{s}}$	7.7	- 5				
$a^8$	8.4	+ 48	+12 49	88 18	329 18	$a^6$
$a^9$	12.2	+ 46	+ 8 59	93 41	334 41	$a^{10}$
$a^{10}$	12.7	+ 11	+12 18	92 49	333 49	$a^{11}$
$a^{11}$	13.4	- 37	+ 9 53	94 29	335 29	$a^{12}$
$a^{12}$		- 9	+11 30	94 58	335 58	$a^{14}$
$a^{\text{n}}$	14.5	- 21				
September 15 1 <sup>h</sup> 16 <sup>m</sup>						
$a^1$	-14.8	+136	+ 8 51	65 45	321 6	
$a^2$	13.7	+129	+ 8 53	66 50	322 11	
$a^3$	13.3	+145	+ 9 54	66 42	322 3	
$a^4$	9.2	+113	+ 9 48	71 2	326 23	
$a^5$	8.9	+150	+11 56	70 17	325 38	
$a^{\text{n}}$	7.7	+104				$a$
$a^{\text{s}}$	5.3	+ 83	+ 9 47	73 44	329 5	
$a^6$	4.4	+140	+13 6	74 17	329 38	
$a^7$	3.8	+110	+11 41	75 31	330 52	$a^4?$
$a^8$	3.8	+ 91	+10 40	76 1	331 22	$a^3$
$a^9$	2.3	+ 58	+ 9 28	78 9	333 30	
$a^{10}$	1.0	+ 53	+ 9 40	79 18	334 39	$a^5$
$a^{11}$	0.5	+ 97	+12 15	78 37	333 59	
$a^{12}$	0.2	+ 41	+ 9 20	80 21	335 42	
$a^{13}$	+ 0.4	+ 55	+10 17	80 24	335 45	
$a^{14}$	1.1	+ 72	+11 29	80 32	335 53	$a^6$
September 17 0 <sup>h</sup> 52 <sup>m</sup>						
$a^1$	-32 <sup>s</sup> 9	+261''	+ 7° 41'	43° 52'	327° 4'	$a$
$a^{\text{n}}$	30.7	+286	+ 9 51	46 19	329 31	$a$
$a^{\text{s}}$	28.8	+266				
$a^2$	28.2	+270	+10 12	47 56	331 8	
$a^3$	27.5	+268	+10 25	48 42	331 54	$a^4$
$a^4$	26.6	+288	+11 49	48 45	331 57	$a^5$
$a^5$	25.7	+245	+ 9 58	51 4	334 16	$a^6$
$a^6$	23.3	+263	+11 56	52 35	335 47	$a^9$
September 18 1 <sup>h</sup> 2 <sup>m</sup>						
$a^1$	-41.3	+346	+ 8 1	30 41	328 0	$a^1$
$a^{\text{s}}$	40.0	+356	+10 4	32 15	329 34	$a$
$a^{\text{n}}$	38.3	+376				
$a^2$	39.4	+397	+11 29	30 26	327 45	
$a^3$	38.3	+405	+12 25	31 16	328 35	$a^2$
$a^4$	37.4	+362	+10 42	34 20	331 39	
$a^5$	36.1	+376	+11 59	35 1	332 20	
$a^6$	36.1	+339	+10 7	36 39	333 58	$a^3$
$a^7$	35.6	+392	+13 2	34 49	332 8	$a^4$
$a^8$	35.1	+367	+12 40	36 30	333 49	
$a^9$	34.1	+365	+12 22	37 37	334 56	$a^5$
September 19 0 <sup>h</sup> 36 <sup>m</sup>						
$a^1$	-48.0	+426	+ 8 25	16 44	327 50	
$a^{\text{s}}$	46.7	+421				
$a^{\text{n}}$	45.2	+444	+ 9 48	19 16	330 22	$a$
$a^2$	44.7	+471	+12 20	18 38	329 44	$a^1$
$a^3$	44.0	+417	+10 2	22 46	333 52	
$a^4$	42.8	+466	+13 4	21 30	332 36	
$a^5$	42.4	+448	+12 24	23 6	334 12	
September 20 0 <sup>h</sup> 43 <sup>m</sup>						
$a^{\text{s}}$	-51.4	+482	+ 9 41	5 3	330 15	$a$
$a^{\text{n}}$	50.3	+506				
$a^1$	48.9	+532	+12 34	5 24	330 36	
September 21 0 <sup>h</sup> 29 <sup>m</sup>						
$a^{\text{s}}$	-52.8	+530	+10 8	352 38	331 44	
$a^{\text{n}}$	52.1	+550				
October 2 23 <sup>h</sup> 46 <sup>m</sup>						
$a^1$	+32.8	-600	-15 8	113 53	246 56	$a^1$
$a^2$	33.4	-650	-18 7	117 55	250 58	$a^2$
$a$	35.1	-631	-16 23	118 41	251 44	$a$



Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1867 October 3 0 <sup>h</sup> 23 <sup>m</sup>						
$a^1$	+21.1	-543''	-15° 38'	97° 55'	245° 22'	$a^1$
$a^2$	23.2	-607	-18 49	103 0	250 27	
$a^3$	24.2	-590	-17 23	103 9	250 36	
$a^4$	24.2	-614	-18 53	104 25	251 52	$a^3$
$a$	25.6	-583	-16 28	104 10	251 37	$a$
October 4 0 <sup>h</sup> 33 <sup>m</sup>						
$a^1$	+ 8.2	-458	-15 30	82 20	243 55	} $B$
$a^2$	13.2	-442	-18 34	89 46	251 21	
$a^3$	13.8	-500	-15 48	88 38	250 13	
$a^{\text{n}}$	14.6	-510	-16 17	90 14	251 49	
$a^{\text{s}}$	15.3	-521				$b$
October 7 0 <sup>h</sup> 34 <sup>m</sup>						
$a$	-43.1	-206	-23 55	26 36	230 17	$a$
$a^1$	40.5	-245	-24 52	30 22	234 3	
$b^1$	31.5	-160	-15 33	37 46	241 27	$b^1$
$b^2$	30.2	-167	-15 19	39 11	242 52	$b^2$
$b^3$	28.4	-169	-14 37	40 50	244 31	
$b^4$	26.3	-187	-14 38	43 11	246 52	
$b^5$	25.8	-217	-16 9	44 18	247 59	$b^3$
$b^{\text{n}}$	23.0	-240	-16 21	47 44	251 25	$b$
$b^{\text{s}}$	22.4	-251				
$c^{\text{s}}$	+54.6	-288				
$c^{\text{n}}$		-270	+ 9 33	123 10	326 51	$c$
October 8 0 <sup>h</sup> 26 <sup>m</sup>						
$a$	-52.5	-120	-23 58	11 49	229 28	
$b^1$	42.6	- 58	-15 12	23 21	241 0	
$b^2$	41.6	- 67	-15 12	24 39	242 18	
$b^3$	37.7	-127	-16 38	30 6	247 45	
$b^4$	37.1	- 95	-14 35	29 58	247 37	
$b^{\text{n}}$		-148	-16 28	33 52	251 31	
$b^{\text{s}}$	34.4	-155				
$c^{\text{s}}$	+46.3	-256				
$c^{\text{n}}$	47.5	-236	+ 9 26	109 6	326 45	$a$
October 13 1 <sup>h</sup> 4 <sup>m</sup>						
$a^{\text{s}}$	-14.0	+147	+ 9 2	39 0	327 11	$a$
$a^{\text{n}}$	12.2	+173				
$a^1$	12.9	+203	+11 19	37 49	326 0	
$a^2$	10.7	+200	+12 5	39 41	327 52	
October 14 0 <sup>h</sup> 24 <sup>m</sup>						
$a^1$	-25.6	+295''	+10° 40'	23° 15'	325° 5'	$a^1$
$a^{\text{s}}$	25.6	+243	+ 8 54	25 20	327 10	$a$
$a^{\text{n}}$	24.1	+266				
$a^2$	20.9	+293	+13 0	27 25	329 15	$a^3$
October 16 23 <sup>h</sup> 23 <sup>m</sup>						
$a^1$	-44.9	+448	+ 9 26	354 54	324 13	$a^1$
$a^2$	44.1	+436	+ 9 15	356 28	325 47	$a^3$
$a^{\text{s}}$	44.0	+408				
$a^{\text{n}}$	42.8	+426	+ 8 39	358 23	327 42	$a$
$a^3$	39.8	+458	+12 26	0 25	329 44	
October 17 23 <sup>h</sup> 55 <sup>m</sup>						
$a^1$	-50.8	+514	+ 9 26	339 20	322 59	
$a^2$	50.8	+500	+ 8 48	340 41	324 20	
$a^3$	50.3	+510	+ 9 33	340 46	324 25	$a^1$
$a^{\text{s}}$	50.3	+475				
$a^{\text{n}}$	49.2	+493	+ 8 39	344 5	327 44	$a$
October 18 0 <sup>h</sup> 33 <sup>m</sup>						
$a^{\text{s}}$	-53.4	+527				
$a^{\text{n}}$	52.4	+544	+ 9 5	330 18	328 21	$a$
$a^1$	52.6	+557	+10 5	327 19	325 22	
November 5 1 <sup>h</sup> 36 <sup>m</sup>						
$a^{\text{s}}$	+41.1	-171				
$a^{\text{n}}$	42.2	-153	+ 8 27	70 24	321 41	$a$
November 6 0 <sup>h</sup> 25 <sup>m</sup>						
$s$	+30.1	-106				
divis'n		- 99	+ 8 31	57 13	321 52	$a$
$n$	31.4	- 85				
November 7 0 <sup>h</sup> 57 <sup>m</sup>						
$a^{\text{s}}$	+16.5	- 25	+ 8 28	42 45	321 43	$a$
$a^{\text{n}}$	17.9	- 2				
November 8 0 <sup>h</sup> 13 <sup>m</sup>						
$a^{\text{s}}$	+ 3.0	+ 56	+ 8 11	29 18	321 53	$a$
$a^{\text{n}}$	4.5	+ 75				

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1867 November 11 23 <sup>h</sup> 55 <sup>m</sup>						
$a_s$	-36.3	+308"	+ 8° 2'	347° 41'	321° 44'	$a$
$a_n$	35.0	+322				
November 12 23 <sup>h</sup> 28 <sup>m</sup>						
$a_s$	-46.2	+378	+ 8 18	333 13	321 30	$a$
$a_n$	45.0	+392				
November 13 0 <sup>h</sup> 3 <sup>m</sup>						
$a_s$	-53.7	+432	+ 8 25	319 3	321 42	$d$
$a_n$	52.7	+444				
December 1 0 <sup>h</sup> 49 <sup>m</sup>						
$a_n$	-34.1	-295	-24 37	340 36	236 19	$a_1 a_2$
$a_s$	33.1	-306				
$b_1$	27.0	-377	-27 45	347 34	243 17	$b_1$
$b_2$	26.3	-380	-27 46	348 16	243 59	$b_2$
$b_3$	25.4	-378	-27 24	349 7	244 50	$b$
$b^1$	25.1	-365	-26 30	349 18	245 1	
$c^1$	+23.1	-465	-20 51	33 15	288 58	
$c$	23.7	-470	-21 1	33 55	289 38	$c$
$c^2$	24.2	-439	-19 3	33 23	289 6	
$c^3$	24.7	-434	-18 38	33 43	289 26	
$d_s$	59.0	-80	+ 9 25	61 38	317 21	$d$
$d_n$		-69				
December 3 0 <sup>h</sup> 29 <sup>m</sup>						
$a_1$	-55.4	-216	-24 30	312 39	236 14	$a$
$a_2$	54.9	-218	-24 30	313 18	236 53	
$b^1$	49.6	-286	-27 29	320 8	243 43	
$b^2$	49.2	-293	-27 49	320 37	244 12	$b$
$b$	48.6	-301	-28 12	321 21	244 56	
$c^1$	5.8	-305	-18 22	2 56	286 31	
$c^2$	3.6	-304	-17 49	4 43	288 18	$c?$
$c$	2.9	-348	-20 17	6 3	289 38	
$d_n$	+37.1	+ 23	+ 9 13	33 44	317 19	
$d_s$	38.0	+ 9				$d$
December 4 0 <sup>h</sup> 40 <sup>m</sup>						
$a$	-62.4	-194	-24 33	299 48	237 20	$a_1$
$b$	57.0	-278	-28 34	308 11	245 43	
$c$	17.6	-312	-21 31	351 57	289 29	
$d_n$	+22.9	+ 78	+ 9 10	19 28	317 0	
$d_s$	23.8	+ 67				

Letter	$\Delta a$	$\Delta \delta$	. h	L	L'	Letter on next date
December 7 23 <sup>h</sup> 43 <sup>m</sup>						
$a_n$	-22.4	+245"	+ 9° 22'	337° 34'	316° 50'	$a$
$a_s$	21.5	+236				
$a_2$	21.5	+236	+ 9 11	338 0	317 16	
December 10 0 <sup>h</sup> 12 <sup>m</sup>						
$a_s$	-56.6	+339	+ 9 37	295 54	317 34	
$a_n$		+347				
December 26 0 <sup>h</sup> 45 <sup>m</sup>						
$a^1$	+ 7.0	+124	+ 5 8	344 33	231 5	$A$
$a^2$	7.9	+124	+ 5 12	345 17	231 49	
$a^3$	7.9	+145	+ 6 26	345 5	231 37	
$a^4$	8.8	+124	+ 5 16	346 0	232 32	
$a$	10.5	+122	+ 5 17	347 24	233 56	
$a^5$	12.1	+113	+ 4 52	348 41	235 13	
$a^6$	12.6	+147	+ 6 53	349 0	235 32	
$a^7$	13.5	+110	+ 4 49	349 50	236 22	
$a^8$	14.6	+145	+ 6 55	350 39	237 11	
$a^9$	15.7	+120	+ 5 33	351 38	238 10	
$a^{10}$	16.1	+136	+ 6 31	351 55	238 27	$b$
$a^{11}$	19.2	+130	+ 6 24	354 30	241 2	
$a^{12}$	20.4	+130	+ 6 30	355 28	242 0	
$b_n$	+11.5	-368	-23 59	352 8	238 40	
$b_s$	12.5	-384				
$b_1$	13.1	-373	-23 42	353 5	239 37	
$b^1$	14.3	-366	-23 10	354 4	240 36	
$b^2$	16.5	-380	-23 52	356 11	242 43	
$b^3$	17.3	-366	-22 56	356 45	243 17	
$c^1$	25.6	-413	-25 8	5 13	251 45	$c^1$
$c^2$	28.9	-425	-25 35	8 40	255 12	
$c^3$	30.0	-463	-27 53	10 41	257 13	
$c^4$	30.8	-454	-27 14	11 19	257 51	
$c$	32.3	-453	-27 2	12 50	259 22	
December 28 0 <sup>h</sup> 14 <sup>m</sup>						
$a$	-25.7	+169	+ 5 52	315 42	229 59	$A$
$a^1$	24.1	+162	+ 5 11	316 59	231 16	
$a^2$	23.6	+153	+ 5 1	317 39	231 56	
$a^3$	18.9	+160	+ 5 37	321 32	235 49	
$a^4$	14.6	+162	+ 5 56	325 5	239 22	
$a^5$	13.9	+163	+ 6 2	325 42	239 59	
$b_1$	17.4	-346	-24 13	323 38	237 56	
$b_2$	16.3	-344	-24 3	324 38	238 55	
$b_3$	15.0	-348	-24 14	325 51	240 8	
$b^1$	14.3	-321	-22 32	326 27	240 44	$b_2$
$b^2$	13.1	-337	-23 27	327 31	241 48	
$b^3$	13.1	-371	-25 35	327 30	241 47	

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1867 December 28—Continued						
$b^4$	-11.8	-367"	-25° 17'	328° 40'	242° 57'	
$b^5$	11.3	-335	-23 14	329 7	243 24	
$c^1$	+ 4.0	-416	-27 27	343 0	257 17	
$c^2$	5.0	-428	-28 10	344 0	258 17	
$c$	7.6	-411	-26 55	346 9	260 26	

December 31 23 <sup>h</sup> 39 <sup>m</sup>						
$a$	-61.2	+172	+ 6 26	273 33	229 36	
$a^1$	60.3	+158	+ 5 33	275 38	231 41	
$a^2$	57.5	+176	+ 6 32	279 38	235 41	
$b^1$	52.9	-333	-23 37	282 0	238 3	
$b_1$	51.5	-337	-23 54	283 56	239 59	
$b_2$	50.5	-335	-23 47	285 16	241 19	

1868 January 5 23 <sup>h</sup> 31 <sup>m</sup>						
$a$	+38.7	-267	-18 48	4 30	30 39	$a^2$
$a^1$	39.6	-275	-19 15	5 32	31 41	
$b_1$	44.8	-283	-19 31	11 25	37 34	$a^4?$
$b_2$	45.2	-266	-18 29	11 33	37 42	$a$
$b^1$	45.8	-256	-17 50	12 3	38 12	$a^5$

January 10 23 <sup>h</sup> 56 <sup>m</sup>						
$a^1$	-39.3	-376	-24 19	285 36	22 9	
$a^2$	35.3	-267	-18 4	292 10	28 43	$a^1$
$a^3$	29.3	-253	-17 38	298 6	34 39	
$a^4$	26.9	-271	-18 52	300 7	36 40	$a^2$
$a^5$	25.3	-258	-18 42	302 9	38 42	$a$
$a^6$	24.3	-274	-18 6	303 25	39 58	
$a^7$	23.5	-255	-18 10	306 18	42 51	$a^3$
$a^8$	20.3	-253	-16 57	306 56	43 29	
$a^9$	19.8	-232	-18 18	311 51	48 24	$a^5$
$a^{10}$	14.8	-246				
$a^{11}$	13.3	-253				

January 11 0 <sup>h</sup> 49 <sup>m</sup>						
$a^1$	-47.2	-292	-18 14	277 24	28 30	
$a^2$	40.8	-298	-19 13	284 30	35 36	
$a^3$	39.1	-284	-19 10	287 0	38 6	
$a^4$	37.9	-303	-17 50	291 2	42 8	
$a^5$	35.0	-266	-17 37	295 14	46 20	
$a^6$	30.8	-257	-18 49	297 13	48 19	
$a^7$	29.1	-268				
$a^8$	27.9	-280				

January 30 0 <sup>h</sup> 30 <sup>m</sup>						
$a$	+35.5	-179"	-21° 37'	334° 21'	351° 55'	$b$
$b$	63.9	-109	-19 18	14 46	32 20	$c$
$b^1$	64.5	-128	-20 24	17 1	34 35	$c^1$

February 1 23 <sup>h</sup> 28 <sup>m</sup>						
$a$	-46.8	-523	-21 54	259 58	305 0	
$b$	+11.1	-237	-21 47	308 33	353 35	
$b^1$	12.1	-242	-22 16	309 21	354 23	
$b^2$	12.8	-182	-18 51	310 39	355 51	
$c$	48.7	-101	-19 3	347 20	32 22	} $A$
$c^1$	49.7	-121	-20 19	348 37	33 40	

February 5 23 <sup>h</sup> 51 <sup>m</sup>						
$a_1$	-12.0	-302	-21 1	282 42	24 5	} $aa^1$
$a_2$	11.4	-308	-21 30	283 4	24 27	
$a^1$	9.3	-291	-21 1	285 18	26 41	
$a^2$	4.4	-275	-21 12	289 54	31 17	

February 8 23 <sup>h</sup> 40 <sup>m</sup>						
$a$	-46.9	-470	-19 58	237 7	20 30	
$a^1$	45.9	-475	-20 36	238 14	21 37	

February 10 23 <sup>h</sup> 51 <sup>m</sup>						
$a$	+16.8	-221	-23 6	303 56	115 29	$a$
$a^1$	18.9	-241	-24 45	305 37	117 10	
$a^2$	20.5	-233	-24 39	307 16	118 49	

February 11 23 <sup>h</sup> 55 <sup>m</sup>						
$a$	+ 2.7	-285	-23 34	289 7	114 45	

February 18 0 <sup>h</sup> 15 <sup>m</sup>						
$a$	-33.4	+252	+17 27	260 27	184 31	} $a$
$a^1$	31.7	+255	+17 3	262 5	186 9	
$a^2$	30.2	+301	+19 18	264 12	188 16	
$a^3$	29.4	+309	+19 31	265 5	189 9	
$b$	+58.6	- 78	-24 19	347 16	271 20	} $bb^1$
$b^1$	59.6	- 60	-23 41	349 15	273 19	
$b^2$	60.8	- 54	-23 2	351 53	275 57	

February 22 0 <sup>h</sup> 19 <sup>m</sup>						
$a$	-65.1	- 23	+16 50	203 2	183 17	
$b$	62.9	+ 37	+18 33	212 15	192 30	



Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1868 February 22—Continued						
$b^1$	-62.9	+ 64''	+20° 9'	212° 22'	192° 37'	
$c^1$	+16.2	-245	-25 37	289 51	270 6	
$c_1$	18.2	-229	-25 16	292 0	272 15	$a_1$
$c_2$	18.3	-217	-24 36	292 18	272 33	$a_2$
$c^2$	19.2	-206	-24 13	293 20	273 35	$a^1$
February 23 0 <sup>h</sup> 32 <sup>m</sup>						
$a_1$	+ 5.4	-295	-25 9	277 54	272 18	
$a_2$	5.8	-284	-24 46	278 28	272 52	
$a^1$	8.3	-263	-24 20	281 10	275 34	
March 4 2 <sup>h</sup> 11 <sup>m</sup>						
$a$	-36.7	-611	-25 12	212 8	347 50	$a$
$a^1$	35.9	-585	-24 19	215 14	350 56	$a^1$
$a^2$	31.1	-570	-25 47	221 45	357 27	$a^2$
$b$	+ 7.4	+565	+22 36	290 15	65 57	$b^1$
March 5 0 <sup>h</sup> 16 <sup>m</sup>						
$a$	-40.8	-660	-25 13	200 13	348 50	
$a^1$	40.9	-647	-24 34	201 30	350 7	
$a^2$	36.6	-625	-25 49	210 7	358 44	
$b$	6.6	+493	+23 42	270 35	59 12	
$b^1$	1.9	+506	+22 10	279 24	68 1	
March 8 1 <sup>h</sup> 8 <sup>m</sup>						
$a^1$	+38.5	+689	+21 9	327 47	159 0	$a^1$
$a^2$	39.1	+693	+21 20	329 18	160 31	$a^2$
$a$	39.8	+719	+23 13	334 15	165 28	$a$
$b$	58.6	+ 93	-18 55	331 22	162 35	
March 11 0 <sup>h</sup> 24 <sup>m</sup>						
$a^1$	+ 8.2	+532	+19 52	283 34	156 28	$a^2$
$a^2$	10.2	+555	+20 35	286 10	159 4	$a^3$
$a^3$	13.9	+600	+22 7	291 21	164 15	$a^4$
$a$	14.4	+620	+23 14	292 43	165 37	$a_1$
$a^4$	15.8	+602	+21 34	293 10	166 4	
March 14 2 <sup>h</sup> 20 <sup>m</sup>						
$a^1$	-32.5	+247	+19 28	237 39	153 47	$a^1$
$a^2$	31.5	+262	+19 54	238 56	155 4	$a^2?$
$a^3$	28.1	+291	+20 4	242 47	158 55	$a^3$
$a^4$	23.6	+361	+22 15	248 27	164 35	$a^5$
$a_1$	22.6	+386	+23 21	249 56	166 4	$a_1$
$a_2$	22.1	+382	+22 54	250 16	166 24	$a_2$
$b$	+31.1	- 80	-22 25	285 2	201 10	$B$

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
March 15 1 <sup>h</sup> 33 <sup>m</sup>						
$a^1$	-43.3	+155''	+19° 22'	223° 34'	153° 17'	
$a^2$	41.7	+196	+21 0	226 4	155 47	
$a^3$	38.0	+220	+20 37	230 33	160 16	
$a^4$	37.6	+232	+21 6	231 15	160 58	
$a^5$	35.6	+275	+22 18	233 38	163 21	
$a^6$	35.1	+254	+21 12	234 16	163 59	
$a_1$	33.6	+307	+23 42	236 44	166 27	} $a$
$a_2$	33.2	+310	+23 42	237 13	166 56	
$b_1$	+14.2	-140	-19 50	266 46	196 29	} $b$
$b_2$	14.7	-139	-19 59	267 16	196 59	
$b^1$	16.5	-137	-20 33	268 55	198 38	$b^1$
$b^2$	18.0	-104	-19 15	270 58	200 41	$b^3$
$b^3$	19.1	-127	-20 56	271 30	201 13	
$b^4$	19.8	-100	-19 41	272 45	202 28	$b^4$
March 16 1 <sup>h</sup> 3 <sup>m</sup>						
$a$	-43.4	+219	+23 22	223 29	166 56	} $a_3$
$b$	+ 1.4	-226	-19 45	252 36	196 3	
$b^1$	4.2	-224	-20 43	254 56	198 23	
$b^2$	5.4	-224	-21 11	256 0	199 27	
$b^3$	5.4	-192	-19 26	256 51	200 18	
$b^4$	7.2	-185	-19 45	258 37	202 4	} $a^1$
$b^5$	8.4	-183	-20 4	259 39	203 6	
March 19 23 <sup>h</sup> 46 <sup>m</sup>						
$a_1$	-31.7	-473	-18 26	211 5	195 53	} $a$
$a_2$	31.1	-459	-18 0	212 25	197 13	
$a_3$	30.4	-474	-19 6	212 20	197 8	
$a^1$	26.9	-450	-19 31	216 56	201 44	
$a^2$	25.4	-428	-19 3	219 22	204 10	
$b$	+11.3	-331	-29 27	255 10	239 58	
$b^1$	13.0	-298	-28 15	257 38	242 26	
$b^2$	14.2	-304	-29 6	258 38	243 26	
March 22 23 <sup>h</sup> 43 <sup>m</sup>						
$a$	-44.4	-638	-19 13	177 52	204 45	} $b$
$b$	+57.0	+195	-14 33	317 11	344 4	
March 23 0 <sup>h</sup> 57 <sup>m</sup>						
$a$	- 0.8	+593	+27 14	267 6	308 44	$a$
$b$	+48.6	+163	-14 32	301 7	342 45	} $b^1$
$b^1$	50.7	+182	-14 1	304 42	346 20	
$b^2$	51.0	+133	-16 52	303 59	345 37	} $b^3$
$b^3$	52.2	+154	-15 58	306 20	347 58	

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1868 March 24 0 <sup>h</sup> 32 <sup>m</sup>						
a	-14.50	+490''	+26° 30'	251° 7'	306° 32'	a
b <sup>1</sup>	+38.5	+106	-14 47	287 10	342 35	b <sup>1</sup>
b <sup>2</sup>	39.3	+122	-14 8	287 44	343 9	b <sub>1</sub> , b <sub>2</sub> , b <sub>3</sub>
b <sup>3</sup>	41.4	+85	-16 51	289 19	344 44	
b	44.0	+70	-18 31	292 9	347 34	
b <sup>4</sup>	45.7	+80	-18 26	294 25	349 50	
b <sup>5</sup>	48.3	+81	-19 9	298 0	353 25	
March 25 1 <sup>h</sup> 1 <sup>m</sup>						
a	-26.2	+395	+26 21	236 26	306 10	a <sup>1</sup> a <sup>2</sup> a <sup>3</sup> a <sup>4</sup> a <sup>5</sup> a <sup>6</sup> a <sup>7</sup> a <sup>8</sup> a <sup>9</sup> a <sup>10</sup>
b <sup>1</sup>	+26.6	+28	-15 6	271 43	341 27	
b <sub>1</sub> <sup>1</sup>	29.3	-12	-18 15	273 26	343 10	
b <sub>2</sub> <sup>2</sup>	30.2	+5	-17 37	274 40	344 24	
b <sub>1</sub>	32.6	+9	-18 14	277 10	346 54	
b <sub>2</sub>	33.7	+15	-18 16	278 25	348 9	
b <sub>3</sub>	35.2	-1	-19 39	279 36	349 20	
b <sup>3</sup>	37.1	+83	-15 37	283 28	353 12	
b <sup>4</sup>	39.3	+95	-15 39	286 4	355 48	
b <sup>5</sup>	40.3	+74	-17 9	286 46	356 30	
March 26 0 <sup>h</sup> 6 <sup>m</sup>						
a <sup>n</sup> <sub>s</sub>	+15.8	-83	-17 46	258 38	341 52	a
a <sup>1</sup>	16.7	-97	-17 24	261 1	344 15	a <sup>2</sup>
a <sub>1</sub> <sup>1</sup>	18.4	-69	-17 24	261 1	344 15	a <sub>1</sub> <sup>1</sup>
a <sub>2</sub> <sup>2</sup>	21.4	-62	-18 0	263 59	347 13	a <sub>2</sub> <sup>2</sup>
a <sub>2</sub> <sup>2</sup>	22.5	-69	-18 55	264 43	347 57	a <sub>2</sub> <sup>2</sup>
a <sub>3</sub> <sup>3</sup>	23.5	-62	-18 55	265 49	349 3	a <sub>3</sub> <sup>3</sup>
a <sup>3</sup>	24.7	+7	-15 32	268 27	351 41	a <sup>4</sup>
a <sup>4</sup>	29.5	+22	-16 25	273 21	356 35	a <sup>5</sup>
March 27 1 <sup>h</sup> 15 <sup>m</sup>						
a <sup>n</sup> <sub>s</sub>	+2.4	-179	-17 43	243 37	341 34	a
a <sup>1</sup>	3.2	-193	-17 43	243 37	341 34	a <sup>1</sup>
a <sup>2</sup>	2.4	-133	-14 40	244 47	342 44	a <sup>2</sup>
a <sup>3</sup>	3.6	-166	-16 55	244 52	342 49	a <sup>3</sup>
a <sub>1</sub> <sup>3</sup>	7.8	-155	-17 59	248 40	346 37	a <sub>1</sub> <sup>3</sup>
a <sub>2</sub> <sup>3</sup>	9.5	-156	-18 41	250 2	347 59	a <sub>2</sub> <sup>3</sup>
a <sub>3</sub> <sup>3</sup>	11.0	-147	-18 48	251 35	349 32	a <sub>3</sub> <sup>3</sup>
a <sup>4</sup>	11.0	-101	-16 18	252 46	350 43	a <sup>4</sup>
a <sup>5</sup>	15.2	-58	-15 34	257 26	355 23	a <sup>5</sup>
b	39.9	+745	+23 30	324 0	61 57	b
March 28 0 <sup>h</sup> 47 <sup>m</sup>						
a <sup>n</sup> <sub>s</sub>	-9.4	-275	-17 45	230 6	341 48	a
a <sup>1</sup>	8.6	-284	-17 45	230 6	341 48	a <sup>1</sup>
March 29 1 <sup>h</sup> 1 <sup>m</sup>						
a <sup>1</sup>	-7.5	-259''	-17° 18'	231° 59'	343° 41'	a <sup>1</sup>
a <sup>2</sup>	7.0	-243	-16 39	232 54	344 36	a <sup>2</sup>
a <sub>1</sub> <sup>3</sup>	4.9	-257	-18 17	234 14	345 56	a <sub>1</sub> <sup>3</sup>
a <sub>2</sub> <sup>3</sup>	3.3	-252	-18 42	235 43	347 25	a <sub>2</sub> <sup>3</sup>
a <sup>4</sup>	2.3	-204	-16 31	237 57	349 39	a <sup>4</sup>
a <sub>1</sub> <sup>5</sup>	0.5	-237	-19 1	238 27	350 9	a <sub>1</sub> <sup>5</sup>
a <sub>2</sub> <sup>5</sup>	+0.2	-239	-19 25	238 58	350 40	a <sub>2</sub> <sup>5</sup>
b <sup>n</sup> <sub>s</sub>	35.0	+745	+23 37	310 35	62 17	b
b <sup>1</sup>	36.1	+732	+23 37	310 35	62 17	b <sup>1</sup>
March 29 1 <sup>h</sup> 1 <sup>m</sup>						
a <sup>n</sup> <sub>s</sub>	-20.4	-377	-18 18	216 5	341 58	a
a <sup>1</sup>	19.5	-386	-18 18	216 5	341 58	a <sup>1</sup>
a <sup>2</sup>	16.9	-363	-18 41	219 26	345 19	a <sup>2</sup>
a <sup>3</sup>	13.3	-291	-16 27	225 5	350 58	a <sup>3</sup>
a <sup>4</sup>	12.5	-447	-25 8	219 46	345 39	a <sup>4</sup>
a <sup>5</sup>	11.4	-347	-20 15	224 42	350 35	a <sup>5</sup>
b <sup>n</sup> <sub>s</sub>	+28.0	+715	+23 26	296 8	62 1	b
b <sup>1</sup>	29.2	+700	+23 26	296 8	62 1	b <sup>1</sup>
March 30 0 <sup>h</sup> 56 <sup>m</sup>						
a <sup>n</sup> <sub>s</sub>	-29.8	-463	-18 20	202 33	342 25	a
a <sup>1</sup>	29.0	-472	-18 20	202 33	342 25	a <sup>1</sup>
a <sup>2</sup>	29.0	-413	-15 44	205 33	345 25	a <sup>2</sup>
a <sup>3</sup>	27.4	-449	-18 19	205 22	345 14	a <sup>3</sup>
a <sub>1</sub> <sup>3</sup>	25.6	-451	-19 16	206 57	346 49	a <sub>1</sub> <sup>3</sup>
a <sub>2</sub> <sup>3</sup>	24.3	-440	-19 18	208 40	348 32	a <sub>2</sub> <sup>3</sup>
a <sub>3</sub> <sup>3</sup>	22.4	-436	-19 58	210 34	350 26	a <sub>3</sub> <sup>3</sup>
a <sup>4</sup>	25.4	-399	-16 40	209 30	349 22	a <sup>4</sup>
a <sup>5</sup>	23.4	-546	-25 16	204 0	343 52	a <sup>5</sup>
a <sup>6</sup>	19.8	-525	-25 52	208 31	348 23	a <sup>6</sup>
b <sup>n</sup> <sub>s</sub>	+19.3	+671	+23 36	282 42	62 34	b
b <sup>1</sup>	20.5	+656	+23 36	282 42	62 34	b <sup>1</sup>
March 31 0 <sup>h</sup> 56 <sup>m</sup>						
a <sub>1</sub>	-37.2	-536	-18 46	189 1	342 55	a <sub>1</sub> , a <sub>2</sub>
a <sub>2</sub>	36.8	-544	-18 46	189 1	342 55	a <sub>2</sub>
a <sup>1</sup>	36.0	-529	-18 7	191 8	345 2	a <sup>1</sup>
a <sup>2</sup>	35.5	-480	-15 58	194 43	348 37	a <sup>2</sup>
a <sup>3</sup>	31.9	-517	-19 35	196 22	350 16	a <sup>3</sup>
a <sup>4</sup>	31.6	-617	-24 47	189 54	343 48	a <sup>4</sup>
a <sup>5</sup>	29.4	-542	-22 3	197 22	351 16	a <sup>5</sup>
a <sup>6</sup>	27.8	-602	-25 56	195 4	348 58	a <sup>6</sup>
b <sup>1</sup>	+4.7	+506	+19 46	260 50	54 44	b <sup>1</sup>
b <sup>2</sup>	5.1	+515	+20 9	261 30	55 24	b <sup>2</sup>
b <sup>3</sup>	8.1	+526	+19 37	264 28	58 22	b <sup>3</sup>
b <sup>n</sup> <sub>s</sub>	9.0	+609	+23 42	269 1	62 55	b
b <sup>1</sup>	10.2	+595	+23 42	269 1	62 55	b <sup>1</sup>
b <sup>2</sup>	10.4	+560	+20 46	267 48	61 42	b <sup>2</sup>

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1868 April 1 1 <sup>h</sup> 10 <sup>m</sup>						
$a^1$	-42.5	-568"	-16° 33'	178° 54'	346° 58'	
$a_1$	42.5	-601	-18 6	175 54	343 58	
$a_2$	42.1	-607	-18 34	175 52	343 56	
$a^2$	42.1	-590	-17 50	177 35	345 39	
$a^3$	40.8	-528	-15 36	184 28	352 32	
$a^4$	39.9	-583	-18 41	181 20	349 24	
$a^5$	39.0	-588	-19 24	182 9	350 13	
$a^6$	37.5	-614	-21 29	181 59	350 3	
$a^7$	36.4	-671	-24 48	177 53	345 57	
$a^8$	34.1	-659	-25 29	182 11	350 15	
$b^1$	9.3	+413	+20 7	245 14	53 18	$b^1$
$b^2$	8.5	+420	+20 11	246 6	54 10	$b^2$
$b^3$	4.9	+438	+19 44	249 37	57 41	$b^3$
$b^4$	4.1	+488	+22 24	251 54	59 58	
$b^n$	2.7	+538				
$b_s$	1.5	+520	+24 4	255 2	63 6	$b$
$b^5$	1.5	+483	+20 58	253 56	62 0	
$c$	5.0	-242	-17 12	230 34	38 38	$c$
April 3 0 <sup>h</sup> 41 <sup>m</sup>						
$a$	-40.5	-716	-24 6	161 42	357 33	
$b^1$	34.5	+205	+19 36	215 34	51 25	$a^1$
$b^2$	33.0	+219	+19 41	217 21	53 12	
$b^3$	29.9	+240	+19 25	220 50	56 41	$a^2?$
$b_s$	26.1	+342				
$b_n$	25.0	+361	+23 57	227 28	63 19	$a$
$c$	28.8	-466	-17 50	201 33	37 24	$b?$
$c^1$	27.0	-442	-17 55	202 10	38 1	
April 6 22 <sup>h</sup> 42 <sup>m</sup>						
$a^1$	-58.8	- 44	+18 33	175 7	51 55	
$a^2$	57.2	+ 7	+20 20	179 46	56 34	
$a_s$		+106				
$a_n$	53.3	+125	+24 22	188 4	64 52	$a$
$b$	45.9	-645	-17 45	158 11	34 59	
$b^1$	45.3	-618	-17 3	163 59	40 47	
$c$	34.0	+311	+25 47	215 31	92 19	$b$
$c^1$	31.1	+335	+25 51	218 52	95 40	
$c^2$	28.9	+343	+25 16	221 13	98 1	
$c^3$	28.9	+358	+26 11	221 33	98 21	
$d$	+34.4	+718	+22 35	297 37	174 26	
April 8 23 <sup>h</sup> 54 <sup>m</sup>						
$a$	-63.1	+ 15	+25 0	161 53	67 27	
$b$	53.0	+135	+25 25	186 47	92 21	
$c$	+56.0	+118	-18 55	295 39	201 13	$b$
$c^1$	56.5	+100	-20 5	296 13	201 47	$b^1$
$c^2$	57.8	+114	-19 34	299 5	204 39	
April 9 0 <sup>h</sup> 57 <sup>m</sup>						
$a$	-56.6	+122"	+27° 37'	179° 48'	100° 0'	
$b$	+47.8	+ 85	-18 25	280 55	201 7	$b^2$
$b^1$	48.1	+ 58	-20 2	280 45	200 57	$b$
$b^2$	52.9	+ 51	-21 53	287 45	207 57	$b^1$
April 11 23 <sup>h</sup> 49 <sup>m</sup>						
$a$	- 8.0	-357	-21 31	214 30	162 7	
$b^1$	+24.6	- 43	-17 23	251 11	198 48	
$b^2$	26.7	- 37	-17 49	253 14	200 51	$a_1$
$b^3$	27.5	- 39	-18 14	253 58	201 35	$a_2$
$b$	27.5	- 72	-19 36	253 25	201 2	$a_1 a_2$
$b^4$	28.2	-171	-25 57	251 48	199 25	
$b^5$	31.3	- 30	-19 8	257 51	205 28	$a^2$
$b^6$	32.2	- 58	-21 1	258 7	205 44	
$b^7$	34.3	- 55	-21 36	260 20	207 57	
$b^8$	34.9	- 60	-22 7	260 54	208 31	$a^3$
April 12 0 <sup>h</sup> 7 <sup>m</sup>						
$a_1$	+13.7	-123	-17 32	238 36	200 25	$a$
$a_2$	14.4	-121	-17 43	239 15	201 4	
$a_1^1$	14.8	-153	-19 37	238 47	200 36	$a_1^5$
$a_2^1$	15.5	-154	-19 56	239 21	201 10	$a_2^5$
$a^2$	19.5	-104	-18 44	244 6	205 55	$a^9$
$a^3$	23.6	-138	-22 12	247 2	208 51	$a^{10}$
$b$	61.2	- 18	-27 45	301 22	263 11	$b$
$b^1$	62.0	- 25	-28 18	304 6	265 55	$b^1$
April 14 0 <sup>h</sup> 26 <sup>m</sup>						
$a^1$	-14.8	-358	-18 31	205 55	195 59	$a^1$
$a^2$	14.6	-333	-17 15	206 58	197 2	$a^2$
$a$	12.7	-319	-17 19	209 2	199 6	$a^3$
$a_3^n$	12.5	-342	-18 56	208 11	198 15	$a^4$
$a_s$		-353				
$a^1$	12.0	-297	-16 26	210 23	200 27	
$a_1^5$	10.4	-345	-19 43	210 4	200 8	
$a_2^5$	9.6	-345	-20 2	210 41	200 45	$a$
$a^6$	9.9	-369	-21 11	209 35	199 39	
$a^7$	8.0	-297	-18 7	213 40	203 44	$a^6$
$a^8$	6.8	-353	-21 41	212 47	202 51	$a^7$
$a^9$	4.7	-288	-18 59	216 41	206 45	$a^9$
$a^{10}$	0.1	-308	-22 18	220 27	210 31	
$b_n$	+46.4	- 78				
$b_s$	47.2	-101	-27 40	271 35	261 39	$b$
$b^1$	50.6	-108	-30 3	277 1	267 5	$b^1$
$b^2$	52.1	-119	-31 13	279 29	269 33	$b^2$



Letter	$\Delta\alpha$	$\Delta\delta$	$h$	$L$	$L'$	Letter on next date
1868 April 15 0 <sup>h</sup> 37 <sup>m</sup>						
$a^1$	-26 <sup>s</sup> .3	-456''	-18° 39'	190° 44'	194° 57'	
$a^2$	25.9	-425	-17 13	192 24	196 37	
$a^3$	24.8	-416	-17 11	193 54	198 7	$a$
$a^4$	23.6	-442	-19 6	193 49	198 2	$a^1$
$a^5$	22.0	-380	-16 32	197 54	202 7	
$a$	21.2	-436	-19 52	196 17	200 30	$a^3$
$a^6$	20.6	-384	-17 22	199 0	203 13	
$a^7$	17.9	-445	-21 50	198 47	202 0	$a^5$
$a^8$	17.6	-416	-20 22	200 14	204 27	$a^7$
$a^9$	16.8	-380	-18 47	202 23	206 36	$a^6$
$b^s$	+36.4	-163	-27 41	257 20	261 33	$b$
$b^n$	37.4	-140				
$b^1$	42.6	-161	-30 20	264 3	268 16	$b^2$
$b^2$	44.4	-170	-31 33	266 26	270 39	$b^3$
April 17 23 <sup>h</sup> 43 <sup>m</sup>						
$a$	-41.0	-569	-17 30	166 1	197 47	$A$
$a^1$	39.9	-587	-18 57	166 3	197 49	
$a^2$	38.0	-555	-18 17	171 6	202 52	
$a^3$	38.0	-580	-19 34	169 10	200 56	
$a^4$	37.4	-604	-21 5	167 42	199 28	
$a^5$	35.5	-602	-21 56	170 30	202 16	
$a^6$	35.0	-534	-18 42	175 55	207 41	
$a^7$	34.4	-573	-20 58	173 56	205 42	
$b^n$	+14.2	-298	-27 55	230 8	261 54	$b$
$b^s$	15.9	-314				
$b^1$	20.2	-291	-29 9	235 22	267 8	
$b^2$	23.1	-298	-30 45	238 0	269 46	$b^1$
$b^3$	25.1	-285	-30 48	240 18	272 4	$b^2$
April 19 0 <sup>h</sup> 12 <sup>m</sup>						
$a^1$	-48.5	-620	-15 47	142 58	203 5	
$a^2$	47.4	-631	-16 58	144 32	204 39	
$a$	46.4	-649	-18 20	144 4	204 11	
$a^3$	45.0	-669	-20 4	144 14	204 21	
$a^4$	44.2	-682	-21 6	143 47	203 54	
$b^n$	8.7	-464				$b$
$b^s$	6.9	-487	-27 49	202 26	262 33	
$b^1$	1.0	-464	-30 11	208 52	268 59	
$b^2$	+ 1.3	-469	-31 27	210 39	270 46	
$c^n$	- 6.3	-337				$a$
$c^s$	4.8	-351	-21 24	209 24	269 31	
$c^1$	2.7	-300	-20 11	213 14	273 21	
$c^2$	1.3	-263				$a^3$
$c^s$	0.2	-275	-19 31	216 20	276 27	
April 21 22 <sup>h</sup> 31 <sup>m</sup>						
$a^n$	-27.7	-500				$a$
$a^s$	26.3	-516	-21 6	181 57	269 9	
April 22 1 <sup>h</sup> 43 <sup>m</sup>						
$a^1$	-25 <sup>s</sup> .7	-500''	-21° 16'	183° 37'	270° 49'	
$a^2$	23.1	-469	-20 45	188 17	275 29	$a^1$
$a^3$	22.4	-455	-20 0	189 40	276 52	$a^3$
$a^4$	21.5	-437				
$a^5$	21.5	-478	-21 54	188 34	275 46	$a^2$
$b^n$	26.9	-609				$b$
$b^s$	25.4	-625	-27 24	176 5	263 17	
$b^1$	22.9	-605	-28 16	180 9	267 21	$b^1$
April 22 1 <sup>h</sup> 43 <sup>m</sup>						
$a^n$	-36.0	-575	-20 16	167 42	270 48	$a^1$
$a^s$		-584				
$a^1$	33.5	-547	-20 27	172 27	275 33	$a^2$
$a^2$	32.7					
$a^3$	31.9	-562	-21 47	172 47	275 53	$a^3$
$a^4$	33.0	-525	-19 34	174 27	277 33	$a$
$a^5$	32.0					
$a^6$	31.4	-545	-21 7	174 24	277 30	
$b^n$	34.4	-673				$b$
$b^s$	32.8	-688	-27 15	161 12	264 18	
$b^1$	30.0	-682	-29 8	165 28	268 34	
$c$	+25.5	- 9	-14 32	241 44	344 50	
$c^1$	27.7	- 16	-15 43	243 38	346 44	
April 24 23 <sup>h</sup> 51 <sup>m</sup>						
$a^1$	-44.3	-672	-21 18	141 30	271 34	
$a^2$	43.9	-657	-20 52	145 13	275 17	
$a^n$		-632				$a$
$a^s$	43.8	-639	-19 55	148 30	278 34	
$a^3$	43.3	-676	-22 4	143 20	273 24	
$b$	39.1	-755	-27 58	136 46	266 50	
$c$	+40.4	+740	+24 56	296 41	66 45	$a$
$c^1$	41.5	+689	+20 50	288 55	58 59	$a^1$
April 25 2 <sup>h</sup> 9 <sup>m</sup>						
$a^1$	+35.0	+658	+20 50	273 35	59 2	$b^1$
$a^2$						
$a^n$	36.2	+727				$b$
$a^s$	37.0	+718	+24 40	282 55	68 22	
April 26 1 <sup>h</sup> 12 <sup>m</sup>						
$a$	+ 2.5	-352	-24 40	209 21	8 17	
$a^1$	4.5	-358	-25 49	210 52	9 48	
$b^n$		+621				$a^3$
$b^s$	27.1	+613	+21 4	260 32	59 28	
$b^1$						
$b^n$	30.3	+701				$a$
$b^s$	31.2	+690	+24 53	270 24	69 20	

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1868 April 28 0 <sup>h</sup> 55 <sup>m</sup>						
$a^1$	+ 3.9	+468"	+20° 44'	230° 56'	57° 46'	
$a^2$	4.6	+493	+21 58	232 26	59 16	
$a^3$	5.8	+496	+21 42	233 33	60 23	
$a^{\text{n}}$	12.2	+591	+24 45	243 11	70 1	$a$
$a^{\text{s}}$	13.1	+583				
April 30 2 <sup>h</sup> 59 <sup>m</sup>						
$a^{\text{s}}$	-12.6	+421	+24 48	214 14	70 31	$a$
$a^{\text{n}}$	11.4	+436				
$b$	+16.2	-394	-32 16	216 39	72 46	$b$
$b^1$	16.9	-381	-31 44	217 39	73 46	
May 1 2 <sup>h</sup> 25 <sup>m</sup>						
$a^1$	-26.0	+353	+25 58	198 44	68 33	
$a^{\text{s}}$	24.0	+343	+24 38	201 9	70 58	$a$
$a^{\text{n}}$	22.8	+356				
$b$	+ 4.9	-475	-32 38	202 53	72 42	
May 3 0 <sup>h</sup> 41 <sup>m</sup>						
$a^{\text{s}}$	-44.8	+199	+24 44	174 59	71 51	$a$
$a^{\text{n}}$	43.9	+213				
$b$	+65.5	+102	-17 50	294 17	191 9	$c$
May 4 0 <sup>h</sup> 49 <sup>m</sup>						
$a^{\text{n}}$	-53.6	+153	+25 11	160 25	71 23	
$a^{\text{s}}$	52.8	+143				
$b$	23.9	-652	-31 17	163 56	74 54	
$b^1$	20.0	-646	-32 30	168 4	79 2	
$b$	+62.6	+ 96	-17 41	279 59	190 57	$A$
May 9 2 <sup>h</sup> 20 <sup>m</sup>						
$a^1$	+ 6.6	- 97	-10 32	207 26	189 28	
$a^2$	10.0	- 95	-11 31	210 14	192 16	$a^1$
$a^3$	10.0	-147	-14 26	209 5	191 7	
$a^4$	11.9	-145	-13 11	209 44	191 46	
$a^5$	13.1	- 59	-10 30	213 34	195 36	
$a$	13.6	-164	-16 36	211 43	193 45	$a^2$
$a^6$	14.3	-148	-15 54	212 39	194 41	
$a^7$	15.5	-164	-17 13	213 19	195 21	
$a^8$	17.1	-177	-18 29	214 23	196 25	$a^3$
$a^9$	17.8	-180	-18 54	214 58	197 0	
$b^{\text{n}}$		-105				$b$
$b^{\text{s}}$	65.7	-121	-29 21	286 44	268 46	

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
May 12 22 <sup>h</sup> 32 <sup>m</sup>						
$a$	-34.2	-324"	- 9° 25'	164° 22'	186° 17'	
$a^1$	27.6	-315	-11 11	170 49	192 44	
$a^2$	25.2	-408	-17 13	169 42	191 37	
$a^3$	20.6	-408	-18 50	173 48	195 43	
$b^{\text{n}}$	+49.6	-183				$a$
$b^{\text{s}}$	50.7	-199	-29 21	247 1	268 56	
May 14 2 <sup>h</sup> 11 <sup>m</sup>						
$a^{\text{n}}$	+27.5	-316	-30 4	217 45	269 52	$a$
$a^{\text{s}}$	29.1	-330				
$a^1$	31.1	-341	-32 9	220 29	272 36	
$a^2$	31.4	-311	-30 20	221 9	273 16	$a^2$
$a^3$	32.4	-279	-28 39	222 39	274 46	
May 17 0 <sup>h</sup> 38 <sup>m</sup>						
$a^{\text{n}}$	- 7.6	-496	-29 18	178 15	271 34	$a$
$a^{\text{s}}$	6.2	-510				
$a^1$	5.3	-510	-30 16	179 25	272 44	
$a^2$	4.4	-512	-30 41	180 9	273 28	$a^1$
$b$	+39.0	+556	+21 33	238 22	331 41	$B$
$b^1$	32.0	+584	+22 45	242 1	335 20	
May 20 0 <sup>h</sup> 2 <sup>m</sup>						
$a^{\text{n}}$	-35.9	-649	-29 12	138 28	273 29	
$a^{\text{s}}$	35.0	-657				
$a^1$	32.6	-662	-30 46	141 17	276 21	
$b$	8.9	+339	+20 27	193 34	328 38	
$b^1$	8.6	+350	+21 1	194 4	329 8	
$b^2$	4.4	+417	+23 54	199 11	334 15	
$b^3$	3.9	+406	+23 4	199 19	334 23	
$b^4$	3.1	+419	+23 38	200 19	335 23	
$b^5$	2.1	+424	+23 40	201 18	336 22	
$b^6$	1.5	+403	+22 8	201 20	336 24	
May 26 0 <sup>h</sup> 35 <sup>m</sup>						
$a$	- 4.5	+327	+19 12	190 36	50 12	$a^1$
$a^1$	2.7	+350	+20 9	192 33	52 9	$a^2$
May 28 1 <sup>h</sup> 3 <sup>m</sup>						
$a^1$	-33.2	+197	+18 54	160 56	48 52	
$a^2$	30.6	+244	+21 8	163 53	51 49	
$a$	29.3	+248	+21 1	165 14	53 10	$a$

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1868 May 29 1 <sup>h</sup> 57 <sup>m</sup>						
a	-41 <sup>s</sup> .7	+200''	+21° 13'	150° 59'	53° 29'	
a <sup>1</sup>	37.1	+191	+19 29	155 51	58 21	
b	21.4	+402	+28 48	173 17	75 47	b
b <sup>1</sup>	20.4	+391	+27 48	174 7	76 37	b <sup>1</sup>
d <sup>n</sup> <sub>s</sub>	+65.0	-118	-23 20	257 47	160 17	d
		-135				
May 30 2 <sup>h</sup> 30 <sup>m</sup>						
a	-56.9	+ 93	+18 23	129 47	46 38	A
b	34.4	+354	+29 6	158 26	75 17	
b <sup>1</sup>	33.4	+335	+27 35	159 27	76 18	
b <sup>2</sup>	30.2	+374	+29 18	163 1	79 52	
c	+19.5	-349	-25 58	195 27	112 18	D
c <sup>1</sup>	23.5	-338	-26 15	199 20	116 11	
d	58.6	-155	-23 14	242 13	159 4	E
d <sup>1</sup>	63.9	-134	-23 10	253 39	170 30	
June 2 23 <sup>h</sup> 28 <sup>m</sup>						
a	-61.1	+254	+28 54	116 34	73 45	} fac
a <sup>1</sup>	60.5	+263	+29 21	117 40	74 51	
a <sup>2</sup>	56.6	+302	+30 59	124 55	82 6	
b <sup>1</sup>	42.3	+256	+23 16	145 33	102 44	
b <sup>2</sup>	40.8	+268	+24 51	147 59	105 10	a <sup>1</sup>
b <sup>3</sup>	39.6	+279	+25 17	149 18	106 29	} a
b <sub>1</sub>	38.1	+285	+25 18	150 59	108 10	
b <sub>2</sub>	37.6	+293	+25 42	151 33	108 44	
c	32.6	-382	-15 38	146 2	103 13	
d	21.2	-488	-24 46	153 29	110 40	
d <sup>1</sup>	18.6	-486	-25 16	155 59	113 10	
e	+25.4	-268	-21 38	199 29	156 40	c <sup>1</sup>
e <sup>1</sup>	28.1	-270	-22 22	202 2	159 13	c <sub>1</sub> c <sub>2</sub>
e <sup>2</sup>	28.9	-291	-23 54	202 40	159 51	c <sup>2</sup>
e <sup>3</sup>	31.9	-245	-21 41	205 54	163 5	c <sup>3</sup>
e <sup>4</sup>	35.2	-240	-22 7	209 19	166 30	c <sup>4</sup>
f	47.1	- 14	-11 2	223 46	180 57	d
June 3 0 <sup>h</sup> 57 <sup>m</sup>						
a <sup>1</sup>	-52.5	+213	+23 53	132 4	104 9	a <sup>1</sup>
a	49.7	+233	+24 31	135 56	108 1	a
b	44.1	-427	-16 1	130 56	103 1	
c <sup>1</sup>	+10.3	-340	-22 33	184 7	156 12	c <sub>1</sub>
c <sub>1</sub>	11.8	-336	-22 38	185 30	157 35	c <sub>2</sub>
c <sub>2</sub>	12.2	-324	-21 57	185 58	158 3	c <sub>3</sub>
c <sup>2</sup>	14.6	-347	-23 57	187 51	159 56	
c <sup>3</sup>	17.9	-306	-22 6	191 19	163 24	c <sup>3</sup>
c <sup>4</sup>	21.7	-304	-22 50	194 50	166 55	
d	33.3	- 78	-11 32	207 47	179 52	
d <sup>1</sup>	37.5	- 67	-11 47	212 2	184 7	e
June 4 2 <sup>h</sup> 40 <sup>m</sup>						
a <sup>1</sup>	-59 <sup>s</sup> .7	+192''	+23° 54'	119° 10'	106° 17'	
a	58.4	+206	+24 30	121 31	108 38	
b	42.5	-559	-24 52	124 50	111 57	
b <sup>1</sup>	41.2	-572	-26 0	125 39	112 46	
c <sub>1</sub>	5.2	-393	-22 25	168 52	155 59	a
c <sub>2</sub>	4.4	-391	-22 26	169 33	156 40	
c <sub>3</sub>	3.6	-384	-22 10	170 24	157 31	
c <sup>1</sup>	0.7	-386	-22 56	172 53	160 0	
c <sup>2</sup>	+ 2.1	-400	-24 25	175 2	162 9	
c <sup>3</sup>	3.3	-356	-21 54	176 54	164 1	
d	15.5	-194	-14 31	189 39	176 46	
d <sup>1</sup>	17.7	-187	-14 33	191 38	178 45	
e	22.5	-119	-11 28	196 36	183 43	
June 6 0 <sup>h</sup> 38 <sup>m</sup>						
a	-29.9	-467	-22 1	142 38	156 38	
a <sup>1</sup>	27.2	-481	-23 27	144 47	158 47	
b	+12.3	-318	-21 9	183 46	197 46	b
b <sup>1</sup>	15.9	-300	-20 44	187 5	201 5	b <sup>1</sup>
June 8 0 <sup>h</sup> 36 <sup>m</sup>						
a <sup>1</sup>	-43.8	-367	-13 35	129 36	171 39	
a	42.6	-370	-13 58	130 55	172 58	
a <sup>2</sup>	41.6	-335	-12 0	133 4	175 7	
b	13.5	-420	-22 22	157 53	199 56	
b <sup>1</sup>	10.0	-399	-21 42	161 30	203 33	
c	+59.9	-292	-28 49	239 22	281 25	a
June 10 0 <sup>h</sup> 36 <sup>m</sup>						
a	+43.4	-354	-28 43	212 4	282 12	a
June 12 0 <sup>h</sup> 34 <sup>m</sup>						
a	+21.0	-421	-28 24	186 20	284 30	a
b	50.7	-280	-24 28	219 12	317 22	
b <sup>1</sup>	52.8	-278	-24 44	222 15	320 25	
June 13 0 <sup>h</sup> 40 <sup>m</sup>						
a	+40.4	-319	-24 46	205 43	317 58	
June 15 0 <sup>h</sup> 41 <sup>m</sup>						
a	+66.1	- 94	-14 16	242 31	22 51	a
a <sup>1</sup>	67.2	-101	-14 58	246 44	27 4	
June 17 0 <sup>h</sup> 28 <sup>m</sup>						
a	+49.6	-141	-13 30	212 21	20 37	b



Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1868 June 17—Continued						
b	+49.6	+426"	+20° 37'	223° 7'	31° 23'	c?
b <sup>r</sup>	51.7	+498	+24 46	231 33	39 49	
June 19 1 <sup>h</sup> 2 <sup>m</sup>						
a	-48.2	-443	-20 36	111 53	308 33	a
b	+22.4	-207	-13 12	182 49	19 29	a
b <sup>r</sup>	28.4	-223	-14 47	188 17	24 57	a <sup>3</sup>
c	26.9	+352	+19 59	192 56	29 36	b
c <sup>r</sup>	27.4	+356	+20 10	193 30	30 10	b <sup>r</sup> ?
c <sup>2</sup>	29.3	+365	+20 29	195 30	32 10	
c <sup>3</sup>	30.3	+390	+21 57	197 10	33 50	
June 20 0 <sup>h</sup> 58 <sup>m</sup>						
a <sup>r</sup>	+ 2.0	-321	-17 48	163 40	14 20	
a	6.9	-241	-13 20	168 26	19 6	
a <sup>2</sup>	8.1	-255	-14 19	169 19	19 59	
a <sup>3</sup>	13.0	-253	-14 44	173 32	24 12	
b	13.2	+326	+20 18	178 44	29 24	a
b <sup>r</sup>	15.4	+347	+21 21	181 4	31 44	
b <sup>2</sup>	18.9	+406	+24 42	185 22	36 2	
b <sup>3</sup>	19.5	-379	+22 54	185 23	36 3	a <sup>2</sup>
June 23 2 <sup>h</sup> 26 <sup>m</sup>						
a <sup>r</sup>	-36.0	+295	+23 6	129 38	23 16	a
a	29.0	+268	+20 53	136 59	30 37	a
a <sup>2</sup>	24.1	+307	+22 58	141 37	35 15	
b	+25.1	+442	+27 13	188 52	82 30	c
b <sup>r</sup>	27.1	+466	+28 35	191 34	85 12	
c <sub>1</sub>	56.6	+344	+17 10	224 39	118 17	d
c <sub>2</sub>	57.6	+341	+16 50	226 23	120 1	
c <sup>r</sup>	57.1	+376	+19 2	227 19	120 57	
c <sup>2</sup>	57.6	+396	+20 11	229 53	123 31	
c <sup>3</sup>	59.6	+357	+17 29	231 32	125 10	
June 25 0 <sup>h</sup> 0 <sup>m</sup>						
a	-50.8	+255	+20 55	110 25	30 41	a
b	19.4	-407	-21 20	139 59	60 15	
b <sup>r</sup>	15.5	-401	-21 11	143 37	63 53	
c	0.2	+394	+26 52	161 52	82 8	
d <sup>n</sup>	+38.6	+312	+17 36	198 7	118 23	b
d <sup>s</sup>	39.7	+295				
d <sup>r</sup>	42.2	+330	+18 55	202 11	122 27	b <sup>r</sup>
d <sup>2</sup>	44.8	+341	+19 19	205 35	125 51	b <sup>2</sup>

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
June 26 0 <sup>h</sup> 4 <sup>m</sup>						
a	-58.6	+261"	+21° 7'	96° 41'	31° 10'	
b <sup>n</sup>	+25.8	+297	+18 9	184 4	118 33	b
b <sup>s</sup>	27.2	+279				
b <sup>r</sup>	30.4	+307	+19 0	188 9	122 38	b <sup>2</sup>
b <sup>2</sup>	34.1	+320	+19 28	192 8	126 37	b <sub>3</sub> b <sub>4</sub>
June 27 0 <sup>h</sup> 49 <sup>m</sup>						
a	-32.9	-339	-16 27	126 27	75 16	a
a <sup>r</sup>	31.8	-355	-17 30	127 17	76 6	a <sup>r</sup>
a <sup>2</sup>	30.6	-337	-16 24	128 46	77 35	a <sup>2</sup>
a <sup>3</sup>	28.7	-350	-17 18	130 25	79 14	a <sup>3</sup>
b <sup>n</sup>	+11.6	+268				
b <sup>s</sup>	12.6	+256	+17 54	169 35	118 24	b
b <sup>r</sup>	13.3	+256	+17 26	170 36	119 25	b <sup>r</sup>
b <sup>2</sup>	16.3	+279	+18 39	173 27	122 16	b <sup>2</sup>
b <sup>3</sup>	19.5	+304	+19 59	176 39	125 28	b <sup>5</sup>
b <sup>4</sup>	20.2	+287	+18 52	177 8	125 57	
June 28 1 <sup>h</sup> 2 <sup>m</sup>						
a	-46.0	-332	-15 54	111 23	74 21	a <sup>r</sup>
a <sup>r</sup>	44.8	-347	-16 52	112 25	75 23	
a <sup>2</sup>	43.2	-341	-16 30	114 28	77 26	a <sup>3</sup>
a <sup>3</sup>	40.6	-365	-18 6	116 55	79 53	a
b <sup>n</sup>	3.1	+251				
b <sup>s</sup>	2.0	+237	+17 49	155 37	118 35	d
b <sup>r</sup>	1.3	+240	+17 30	156 44	119 42	
b <sup>2</sup>	+ 2.1	+258	+18 26	159 43	122 41	d <sup>r</sup>
b <sup>3</sup>	4.0	+258	+18 20	161 20	124 18	
b <sup>4</sup>	4.8	+277	+19 28	162 11	125 9	d <sup>2</sup>
b <sup>5</sup>	6.3	+284	+19 50	163 33	126 32	d <sup>3</sup>
c	60.4	-371	-25 26	227 16	190 14	f
June 30 2 <sup>h</sup> 57 <sup>m</sup>						
a <sup>r</sup>	-62.8	-309	-15 40	80 46	72 56	
a <sup>2</sup>	62.1	-302	-15 6	83 32	75 42	
a <sup>3</sup>	61.6	-316	-15 59	83 56	76 6	
a	59.7	-334	-17 0	87 38	79 48	a
b	45.6	+510	+36 24	102 44	94 54	
b <sup>r</sup>	44.4	+533	+38 4	103 11	95 21	
c	42.7	+428	+30 46	110 52	103 2	
d <sup>s</sup>	32.3	+219				
d <sup>n</sup>	31.4	+228	+17 34	126 46	118 56	b
d <sup>r</sup>	28.8	+219	+17 13	129 44	121 54	b <sup>r</sup>
d <sup>2</sup>	24.6	+254	+19 18	133 36	125 46	
d <sup>3</sup>	23.8	+265	+19 59	134 15	126 25	

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date	
1868 June 30—Continued							
$e^1$	-19 <sup>s</sup> .3	-433''	-23° 17'	135° 52'	128° 2'	$c^1$ $c$ $c^3, c^4$ $d$	
$e$	18.7	-440	-23 46	136 24	128 34		
$e^2$	17.7	-431	-23 11	137 26	129 36		
$e^3$	14.7	-440	-23 53	140 9	132 19		
$e^4$	14.0	-440	-23 55	140 49	132 59		
$f$	+44.3	-408	-25 1	198 18	190 28		
July 1 2 <sup>h</sup> 59 <sup>m</sup>							
$a$	-63.6	-328	-17 32	74 50	81 3	$a$ $a^1?$ $b^2$ $b$ $b^3$ $c$	
$b^s$	44.4	+217	+17 31	112 47	119 0		
$b^n$	43.5	+233					
$b^1$	41.6	+226	+17 34	115 26	121 39		
$c^1$	32.8	-454	-24 39	121 6	127 19		
$c$	31.7	-436	-23 25	122 41	128 54		
$c^2$	30.2	-422	-22 29	124 35	130 48		
$c^3$	28.5	-447	-24 11	125 49	132 2		
$c^4$	27.3	-448	-24 15	127 2	133 15		
$d$	+33.0	-424	-24 51	184 33	190 46		
July 2 0 <sup>h</sup> 57 <sup>m</sup>							
$a^s$	-52.8	+226	+17 7	100 31	119 36	$a$ $a^1$ $b^1$ $b$ $b^2$ $b^3$	
$a^n$		+235					
$a^1$	51.4	+264	+19 30	101 39	120 43		
$a^2$	39.5	+240	+18 15	116 35	135 39		
$b^1$	47.9	-434	-23 45	102 26	121 30		
$b$	43.6	-418	-22 32	108 49	127 53		
$b^2$	43.6	-452	-24 51	107 42	126 46		
$b^3$	37.9	-444	-24 10	115 0	134 4		
$c$	+19.5	-416	-23 17	170 10	189 14		
July 3 2 <sup>h</sup> 49 <sup>m</sup>							
$a$	-60.5	+245	+17 27	85 40	119 52	$a$ $b^1$ $b^2$ $b$	
$a^1$	49.8	+259	+18 58	102 43	136 55		
$b^1$	56.4	-406	-22 43	88 10	122 22		
$b$	53.1	-404	-22 19	94 31	128 43		
$b^2$	52.8	-436	-24 31	93 30	127 42		
$b^3$	48.8	-426	-23 33	100 27	134 39		
July 4 0 <sup>h</sup> 57 <sup>m</sup>							
$a$	-64.1	+256	+17 15	74 25	121 33	$a$ $a^1$ $b^1$ $b^2$	
$b^1$	60.6	-406	-23 45	75 5	122 13		
$b^2$	58.7	-400	-22 57	82 7	129 15		
$b$	55.6	-420	-23 57	88 10	135 18		
$c$	56.4	+354	+24 11	87 57	135 5		
$c^1$	54.3	+338	+23 21	92 28	139 36		
July 5 2 <sup>h</sup> 55 <sup>m</sup>							
$a$	-62 <sup>s</sup> .0	-391''	-23° 31'	69° 17'	131° 36'		
$a^1$	60.7	-403	-24 1	74 0	136 19		
$b$	61.2	+366	+23 51	73 31	135 50		
$b^1$	60.7	+385	+25 5	73 12	135 31		
$b^2$	59.5	+366	+24 9	78 55	141 14		
July 12 23 <sup>h</sup> 23 <sup>m</sup>							
$a$	+ 8.5	-344	-16 31	152 9	310 38		
$a^1$	10.5	-372	-18 16	154 6	312 35		
July 17 23 <sup>h</sup> 41 <sup>m</sup>							
$a^1$	-11.6	-401	-21 0	130 43	359 33	$a$ $a^1$ $a^2$ $b$ $b^1$ $c$	
$a^2$	8.6	-429	-22 37	133 33	2 23		
$a^3$	4.8	-435	-22 41	137 2	5 52		
$a^4$	2.9	-439	-22 47	138 50	7 40		
$a^5$	+ 1.6	-513	-27 33	143 26	12 16		
$a$	3.5	-503	-26 41	145 8	13 58		
$b$	54.7	-364	-15 46	199 10	68 0		
July 18 1 <sup>h</sup> 49 <sup>m</sup>							
$a$	-25.6	-403	-22 41	116 38	0 45		$a$ $a^1$ $b$ $b^1$ $c$ $d$ $d^2$
$a^1$	20.7	-423	-23 26	121 25	5 32		
$a^2$	18.2	-423	-23 10	123 46	7 53		
$b$	12.1	-503	-28 2	129 41	13 48		
$b^1$	11.3	-496	-27 27	130 23	14 30		
$c$	+45.0	-385	-16 30	184 37	68 44		
$d^s$	53.5	-503					
$d^n$	54.4	-478	-24 5	205 4	89 11		
$d^1$	57.9	-467	-23 2	215 9	99 16		
July 19 2 <sup>h</sup> 2 <sup>m</sup>							
$a$	-39.2	-360	-21 49	101 48	359 56	$a$ $b$ $b^1$ $c$ $d$ $d^1$ $d^3$ $e$	
$a^1$	34.5	-367	-21 30	107 24	5 32		
$b$	25.8	-476	-27 54	115 22	13 30		
$b^1$	24.2	-474	-27 32	117 3	15 11		
$c$	+33.2	-386	-16 18	170 24	68 32		
$c^1$	33.5	-413	-18 13	171 21	69 29		
$d^s$	45.9	-517					
$d^n$	47.3	-494	-24 22	191 14	89 22		
$d^1$	49.5	-484	-22 52	194 49	92 57		
$d^2$	53.4	-480	-22 51	202 4	100 12		

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1868 July 20 1 <sup>h</sup> 8 <sup>m</sup>						
a	-47 <sup>s</sup> .7	-332''	-21° 38'	90° 44'	23° 1'	
b	37.7	-443	-27 29	101 36	13 23	
b <sup>1</sup>	35.8	-445	-27 18	103 49	15 36	
c	+20.3	-364	-15 31	156 38	68 25	
d <sup>s</sup>	36.3	-520	-24 16	177 19	89 6	a
d <sup>n</sup>	37.7	-497	-24 16	177 19	89 6	
d <sub>1</sub>	38.1	-505	-23 55	178 28	90 15	
d <sup>1</sup>	40.6	-493	-23 6	181 10	92 57	
d <sup>2</sup>	45.5	-492	-23 0	187 57	99 44	a <sup>4</sup>
d <sup>3</sup>	46.5	-481	-22 13	188 54	100 41	a <sup>6</sup>
d <sup>4</sup>	55.3	-479	-22 33	206 7	117 54	
e	61.8	+171	+18 10	205 3	116 50	b
July 26 23 <sup>h</sup> 29 <sup>m</sup>						
a <sup>n</sup>	-40.5	-345	-22 57	95 17	90 18	a
a <sup>s</sup>	39.4	-367	-22 57	95 17	90 18	
a <sup>1</sup>	37.6	-392	-24 54	97 44	92 45	
a <sup>2</sup>	36.0	-376	-23 28	99 44	94 45	a <sup>1</sup>
a <sup>3</sup>	34.5	-365	-22 25	101 24	96 25	
a <sup>4</sup>	31.8	-399	-24 8	104 7	99 8	
a <sup>5</sup>	31.3	-410	-24 50	104 40	99 41	
a <sup>6</sup>	31.3	-376	-22 31	104 46	99 47	a <sup>3</sup>
a <sup>7</sup>	29.8	-331	-19 15	106 21	101 22	
a <sup>8</sup>	29.1	-395	-23 21	107 4	102 5	a <sup>4</sup>
a <sup>9</sup>	27.9	-390	-22 48	108 18	103 19	a <sup>5</sup>
b	7.1	+223	+17 53	121 52	116 53	
c	+41.3	-355	-11 47	173 1	168 2	b <sup>1</sup>
c <sup>1</sup>	43.8	-349	-11 16	175 49	170 50	b <sup>1</sup> ? b <sup>2</sup>
July 28 0 <sup>h</sup> 55 <sup>m</sup>						
a <sup>n</sup>	-58.0	-270	-23 2	67 30	91 25	
a <sup>s</sup>		-285	-23 2	67 30	91 25	
a <sup>1</sup>	55.8	-303	-24 2	71 22	95 17	
a <sup>2</sup>	53.5	-310	-23 47	75 20	99 15	
a <sup>3</sup>	52.6	-299	-22 46	76 59	100 54	
a <sup>4</sup>	51.9	-315	-23 39	77 49	101 44	
a <sup>5</sup>	50.7	-324	-23 54	79 38	103 33	
b	+12.5	-315	-11 35	142 25	166 20	a
b <sup>1</sup>	17.0	-322	-11 27	146 30	170 25	
b <sup>2</sup>	18.1	-321	-11 15	147 28	171 23	
c	63.9	+197	+22 41	207 0	230 55	b?
July 31 0 <sup>h</sup> 47 <sup>m</sup>						
a	-32.1	-185	-11 5	99 13	165 10	a
a <sup>1</sup>	31.5	-176	-10 23	99 47	165 44	
b <sup>1</sup>	+33.9	+236	+25 1	155 14	221 11	
b	39.7	+168	+21 26	161 35	227 32	c
August 2 0 <sup>h</sup> 43 <sup>m</sup>						
a	-54.2	-86	-11 5	71 6	165 5	
b	49.8	-246	-19 50	77 22	171 21	
c <sup>s</sup>	+11.5	+230	+22 7	131 27	225 26	
c <sup>n</sup>	12.8	+239	+22 7	131 27	225 26	
c <sup>1</sup>	16.7	+246	+23 34	135 36	229 35	a <sup>1</sup>
c <sup>2</sup>	19.0	+234	+23 12	137 54	231 53	
c <sup>3</sup>	19.3	+218	+22 16	138 20	232 19	a
c <sup>4</sup>	22.9	+227	+23 20	141 43	235 42	
c <sup>5</sup>	23.7	+241	+24 23	142 30	236 29	
August 9 0 <sup>h</sup> 56 <sup>m</sup>						
a <sup>1</sup>	-51.8	+553	+22 51	37 30	229 52	
a	48.8	+571	+25 20	43 29	235 50	
b	+22.6	+176	+21 28	134 38	326 59	
b <sup>1</sup>	23.4	+176	+21 36	135 22	327 43	
b <sup>2</sup>	23.7	+136	+19 16	136 4	328 25	
b <sup>3</sup>	24.4	+136	+19 24	136 45	329 6	
c <sup>s</sup>	36.5	-664	-28 8	171 17	3 38	a
c <sup>n</sup>	38.0	-649	-28 8	171 17	3 38	
c <sup>1</sup>	39.0	-631	-26 6	172 0	4 21	
c <sup>2</sup>	39.6	-667	-28 30	176 0	8 21	a <sup>2</sup>
August 11 3 <sup>h</sup> 53 <sup>m</sup>						
a <sup>n</sup>	+15.1	-612	-28 32	142 24	4 32	a
a <sup>s</sup>	17.3	-632	-28 32	142 24	4 32	
a <sup>1</sup>	19.1	-632	-28 32	142 24	4 32	
a <sup>2</sup>	21.1	-636	-28 32	148 6	10 14	a <sup>1</sup>
a <sup>3</sup>	22.0	-636	-28 32	148 6	10 14	
a <sup>4</sup>	30.6	-636	-28 32	148 6	10 14	
August 12 3 <sup>h</sup> 10 <sup>m</sup>						
a <sup>s</sup>	+3.8	-597	-28 27	129 22	5 7	a
a <sup>n</sup>	6.0	-575	-28 27	129 22	5 7	
a <sup>1</sup>	10.1	-597	-27 58	134 40	10 25	a <sup>2</sup>
a <sup>2</sup>	18.0	-550	-22 54	140 43	16 28	a <sup>3</sup>
a <sup>3</sup>	21.5	-575	-23 53	145 10	20 55	a <sup>4</sup>
August 13 3 <sup>h</sup> 5 <sup>m</sup>						
a <sup>n</sup>	-8.8	-553	-28 28	115 38	5 22	a
a <sup>s</sup>	6.6	-528	-28 28	115 38	5 22	
a <sub>1</sub>	6.2	-546	-28 27	117 9	6 53	
a <sup>1</sup>	6.2	-594	-31 55	118 14	7 58	a <sup>1</sup>



Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1868 August 13—Continued						
$a^2$	-2 <sup>s</sup> .1	-548''	-27° 28'	121° 2'	10° 46'	$a^5$
$a^3$	+3.2	-506	-23 12	124 51	14 35	$a^6$
$a^4$	6.9	-542	-24 42	129 14	18 58	$a^8$
$b$	4.2	-721	-38 52	133 0	22 44	$b$
$b^1$	7.8	-732	-38 46	137 25	27 9	$b^1$
August 14 3 <sup>h</sup> 26 <sup>m</sup>						
$a^{\text{n}}$	-21.5	-475	-28 31	101 37	5 35	$a$
$a^{\text{s}}$	19.4	-498				
$a^1$	19.0	-536	-31 36	103 47	7 45	
$a^2$	18.6	-502	-29 0	103 43	7 41	$a^4$
$a^3$	17.1	-446	-24 41	104 20	8 18	$a^3$
$a^4$	17.1	-466	-26 3	104 37	8 35	
$a^5$	14.8	-491	-27 4	107 12	11 10	
$a^6$	11.3	-457	-23 43	109 54	13 52	$a^6$
$a^7$	9.1	-462	-23 26	112 1	15 59	
$a^8$	5.5	-505	-25 18	116 12	20 10	
$b$	7.7	-678	-38 53	118 11	22 9	
$b^1$	3.2	-694	-38 44	123 26	27 24	
$c$	+47.5	-625	-23 29	184 52	88 50	$b^1$
August 16 23 <sup>h</sup> 45 <sup>m</sup>						
$a^1$	-43.1	-390	-31 12	72 27	2 21	$a^2$
$a^2$	42.5	-329	-25 41	74 47	4 41	$a^1$
$a^{\text{n}}$	41.7	-367				
$a^{\text{s}}$	39.9	-398	-28 40	76 56	6 50	$a$
$a^3$	39.6	-339	-25 14	78 23	8 17	
$a^4$	39.3	-392	-28 45	78 50	8 44	$a^3$
$a^5$	36.8	-406	-28 44	81 58	11 52	$a^4$
$a^6$	35.2	-352	-24 29	83 32	13 26	
$b^1$	+36.0	-619	-23 16	161 5	90 59	$b^1$
$b^{\text{s}}$	43.3	-639				
$b^{\text{n}}$	44.2	-630	-23 56	174 59	104 53	$b$
$b^2$	44.8	-617	-22 9	175 28	105 22	$b^2$
$c$	49.1	+169	+27 22	158 40	88 34	$c$
August 17 23 <sup>h</sup> 59 <sup>m</sup>						
$a^1$	-52.3	-277	-26 33	59 48	3 52	$a^1$
$a^2$	52.5	-333	-30 18	59 40	3 44	
$a^{\text{n}}$	50.8	-307				
$a^{\text{s}}$	49.6	-339	-28 43	62 57	7 1	$a$
$a^3$	48.8	-335	-28 55	65 4	9 8	
$a^4$	47.5	-333	-28 11	67 6	11 10	$a^3$
$b^1$	+26.0	-595	-23 9	146 53	90 57	$b$
$b^{\text{s}}$	35.6	-631				
$b^{\text{n}}$	36.6	-622	-23 29	160 56	105 0	$c$
$b^2$	37.3	-611	-22 11	161 30	105 34	$c^2$
$b^3$	47.7	-606	-20 59	180 34	124 38	$d$
$c$	39.2	+185	+26 52	144 19	88 23	
Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
August 18 0 <sup>h</sup> 7 <sup>m</sup>						
$a^1$	-58 <sup>s</sup> .7	-221''	-26° 17'	46° 47'	4° 58'	$a^1?$
$a^{\text{n}}$	57.7	-256				
$a^{\text{s}}$	56.5	-279	-28 34	49 42	7 53	$a$
$a^2$	56.6	-230	-25 46	51 17	9 28	
$a^3$	55.2	-279	-28 23	53 26	11 37	
$a^4$	54.9	-302	-29 50	53 41	11 52	
$b$	+14.2	-557	-23 6	132 38	90 49	$b$
$c^1$	24.8	-583	-22 21	144 14	102 25	$c^1$
$c^{\text{n}}$	25.4	-599				
$c^{\text{s}}$	26.7	-612	-23 37	146 37	104 48	$c$
$c^2$	27.5	-594	-22 31	147 40	105 51	$c^2$
$d^1$	40.5	-635	-23 12	167 31	125 42	$d^2$
$d$	40.9	-607	-21 6	165 44	123 55	$d^1$
$d^2$	41.9	-623	-22 9	168 55	127 6	$d^3$
August 19 23 <sup>h</sup> 52 <sup>m</sup>						
$a^1$	-62.5	-163	-25 13	35 8	7 12	
$a^{\text{n}}$		-207				
$a^{\text{s}}$	61.4	-226	-28 4	37 40	9 44	
$b$	+1.6	-507	-23 1	118 46	90 50	$a$
$c^1$	13.2	-552	-18 30	135 19	107 23	
$c^{\text{n}}$	14.1	-557				
$c^{\text{s}}$	15.2	-575	-23 27	132 39	104 43	$b$
$c^2$	16.2	-558	-22 29	133 47	105 52	$b^1$
$d$	30.7	-593	-21 33	150 27	122 31	$c$
$d^1$	31.7	-588	-21 0	151 18	123 22	$c^1$
$d^2$	32.6	-624	-23 21	154 29	126 33	
$d^3$	33.4	-606	-21 56	154 26	126 30	
$d^4$	34.2	-619	-22 42	156 16	128 20	$c^2$
August 21 0 <sup>h</sup> 29 <sup>m</sup>						
$a$	-24.4	-368	-22 10	90 36	91 6	$a$
$b^{\text{n}}$	11.9	-453				
$b^{\text{s}}$	10.6	-471	-23 51	104 32	105 2	$b$
$b^1$	10.0	-459	-23 15	105 39	106 9	$b^2$
$b^2$	9.3	-477	-24 14	106 38	107 8	
$c$	+5.4	-509	-21 43	121 7	121 37	$c$
	6.4					
$c^1$	7.9	-522	-22 2	123 16	123 46	$c^1$
$c^2$	10.4	-537	-22 17	125 59	126 29	
August 22 0 <sup>h</sup> 10 <sup>m</sup>						
$a$	-35.8	-285	-21 5	77 11	91 32	
$b^1$	24.0	-434	-26 22	91 13	105 34	
$b^{\text{n}}$	24.5	-377				
$b^{\text{s}}$	23.1	-390	-22 58	90 37	104 58	$a$
$b^2$	22.5	-409	-24 9	92 16	106 37	$a^1$
$c$	8.1					
	6.8	443	-21 38	106 53	121 14	$b$

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1868 August 22—Continued						
$c^1$	$-5^s.4$	$-455''$	$-21^\circ 25'$	$108^\circ 53'$	$123^\circ 14'$	$b^3$
$c^2$	1.1	-480	-21 43	113 18	127 39	
$d$	+12.4	+145	+18 46	112 13	126 34	$c$
$d^1$	15.5	+145	+19 36	115 0	129 21	$c^1?$
August 23 0 <sup>h</sup> 11 <sup>m</sup>						
$a_n$	-36.5	-312	-23 17	76 27	104 50	$a$
$a_s$	35.5	-321				
$a^1$	34.8	-317	-22 51	77 44	106 7	$a^1$
$a^2$	34.3	-335	-23 49	78 27	106 50	
$b^1$	22.8	-372	-21 53	90 36	118 59	
$b$	21.3					$b$
	20.1	-379	-21 36	92 40	121 3	
$b^2$	19.5	-377	-21 3	93 47	122 10	$b^1$
$b^3$	19.1	-393	-21 56	94 26	122 49	$b^2$
$c$	1.8	+205	+18 9	97 28	125 51	
$c^1$	+0.8	+189	+18 1	100 2	128 25	
August 25 2 <sup>h</sup> 47 <sup>m</sup>						
$a_n$	-55.4	-172	-23 35	47 15	105 13	$a$
$a_s$		-186				
$a^1$	54.5	-179	-23 7	48 55	106 53	$a^1$
$b$	44.9	-237	-22 6	63 48	121 46	$b$
	44.3					
$b^1$	43.8	-230	-21 20	64 43	122 41	$b^2$
$b^2$	43.8	-239	-21 53	64 48	122 46	$b^1$
$b^3$	41.4	-234	-20 33	67 39	125 37	$b^3$
$c$	+8.5	+322	+28 14	101 51	159 49	$c^1$
$c^1$	11.7	+306	+28 16	105 15	163 13	$c^2$
$c^2$	12.3	+327	+29 43	105 21	163 19	$c^3$
$d$	35.2	-518	-14 9	146 49	204 47	$d$
August 26 2 <sup>h</sup> 54 <sup>m</sup>						
$a_n$	-60.9	-118	-23 42	33 52	105 57	
$a_s$		-132				
$a^1$	60.4	-128	-23 31	35 28	107 33	
$b$	53.3	-172	-22 16	50 6	22 11	$a$
$b^1$	52.8	-176	-22 18	50 50	122 55	
$b^2$	52.5	-167	-21 35	51 17	123 22	
$b^3$	50.9	-165	-20 41	53 44	125 49	
$c$	4.5	+383	+27 32	87 5	159 10	
$c^1$	3.9	+381	+27 39	87 45	159 50	
$c^2$	0.8	+367	+27 53	91 0	163 5	
$c^3$	+0.9	+391	+29 52	91 48	163 53	
$c^4$	1.2	+371	+28 47	92 42	164 47	$b$
$d$	24.1	-476	-13 51	132 31	204 36	$c_1 c_2$
Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
August 28 2 <sup>h</sup> 57 <sup>m</sup>						
$a$	-63.3	-56''	-21° 49'	23° 19'	123° 29'	
$b^1$	27.2	+512	+26 9	57 50	158 0	
$b$	20.2	+502	+28 28	65 32	165 42	
$c_1$	2.0	-347	-13 18	104 8	204 18	
$c_2$	1.5	-354	-13 35	104 40	204 50	
August 31 23 <sup>h</sup> 51 <sup>m</sup>						
$a$	-37.2	-226	-19 4	67 1	207 29	$a$
$a^1$	35.2	-244	-19 16	69 30	209 58	$a^2$
September 2 23 <sup>h</sup> 16 <sup>m</sup>						
$a$	-56.0	-63	-18 34	37 59	206 10	
$a^1$	54.8	-101	-20 11	40 31	208 42	
$a^2$	53.8	-93	-19 8	42 12	210 23	
$b^1$	47.9	-51	-13 45	50 4	218 15	
$b$	46.8	-90	-15 30	52 7	220 18	
$c$	+32.5	+130	+24 40	120 50	289 1	
$c^1$	35.5	+130	+25 30	124 10	292 21	
$d^1$	50.4	+128	+29 9	144 12	312 23	} $B$
$d$	50.6	+102	+27 37	144 37	312 48	
$d^2$	52.3	+137	+30 6	147 35	315 46	
$d^3$	53.2	+116	+28 59	149 0	317 11	
September 5 23 <sup>h</sup> 25 <sup>m</sup>						
$a$	+7.8	-508	-19 25	110 1	320 24	$a_1$
$a^1$	8.9	-522	-19 57	111 31	321 54	
$a^2$	9.9	-531	-20 10	112 43	323 6	$a^1$
$b_1$	15.3	+267	+27 31	97 56	308 19	$b$
$b_2$	15.7	+272	+27 57	98 12	308 35	$b^1$
$b_3$	16.1	+258	+27 16	98 54	309 17	$b^2$
$b^1$	18.4	+267	+28 35	100 56	311 19	} $b^3 b^4$
$b^2$	22.5	+239	+28 18	105 32	315 55	
$b^3$	25.7	+232	+28 56	108 56	319 19	
$b^4$	26.5	+251	+30 21	109 29	319 52	
$c^1$	35.5	-772	-30 8	161 43	12 6	$c^2$
$c_s$	36.3	-755				
$c_n$	37.2	-742	-27 51	159 52	10 15	$c$
$d$	38.4	-625	-18 15	148 16	358 39	$d$
September 6 23 <sup>h</sup> 52 <sup>m</sup>						
$a_1$	-6.5	-428	-19 3	94 26	319 6	$a^1$
$a_2$	5.6	-428	-19 9	95 13	319 53	$a$
$a^1$	3.0	-461	-20 15	98 21	323 1	$a^2$
$a^2$	1.7	-454	-19 23	99 7	323 47	$a^4$
$b$	+3.4	+350	+28 4	83 39	308 19	$b$

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1868 September 6—Continued						
$b^1$	+ 4 <sup>s</sup> 1	+353''	+28° 29'	84° 10'	308° 50'	
$b^2$	4.5	+341	+27 58	84 55	309 35	
$b^3$	10.5	+290	+27 10	91 46	316 26	
$b^4$	11.0	+309	+28 28	91 45	316 25	
$c^1$	29.6	-767	-30 28	147 51	12 31	
$c^2$	30.2	-763	-29 58	148 21	13 1	$c^1$
$c^s$	30.5	-748				
$c^n$	31.6	-734	-28 1	147 1	11 42	$c$
$d$	31.6	-614	-18 49	137 15	1 55	

September 8 0 <sup>h</sup> 4 <sup>m</sup>						
$a^1$	-32.8	-250	-19 25	64 49	317 51	$a^1$
$a^n$	31.8	-248				
$a^s$	30.9	-257	-19 7	65 53	318 45	$a$
$a^2$	28.2	-307	-20 52	70 26	323 18	$a^4$
$a^3$	26.9	-285	-18 57	71 17	324 9	
$a^4$	26.2	-306	-19 55	72 22	325 14	
$a^s$	25.1	-305				
$a^n$	25.1	-317	-19 47	73 27	326 19	$a^7$
$b$	17.9	+515	+28 43	55 33	308 25	
$c^1$	+13.5	-699	-29 57	121 14	14 6	$c^1$
$c^n$	13.1	-668				
$c^s$	14.1	-681	-28 10	119 53	12 45	$c$

September 10 3 <sup>h</sup> 0 <sup>m</sup>						
$a^1$	-53.1	-85	-19 47	35 30	318 9	$a_2$
$a$	52.6	-75	-18 55	36 7	318 46	$a_1$
$a^2$	51.9	-101	-20 3	37 35	320 14	$a^1$
$a^3$	50.5	-92	-18 46	39 31	322 10	
$a^4$	49.6	-138	-21 1	41 28	324 7	$a^2$
$a^5$	49.0	-143	-21 15	42 33	325 12	
$a^6$	47.3	-158	-20 58	44 53	327 32	$a^3$
$a^7$	46.7	-138	-19 31	45 25	328 4	
$b$	32.9					
$c^n$	10.3	-528				
$c^s$	9.2	-544	-27 38	91 2	13 41	$b$
$c^1$	9.5	-567	-29 38	92 13	14 52	$b^1$
$e$	+37.0	-578	-14 24	138 4	60 43	$e$
$f$	61.9	+				

September 12 23 <sup>h</sup> 20 <sup>m</sup>						
$a_1$	-62.6	+ 28	-19 47	10 4	318 38	
$a_2$	62.3	+ 12	-20 28	11 26	320 0	
$a^1$	61.6	+ 14	-19 44	14 6	322 40	
$a^2$	60.7	- 5	-20 10	17 1	325 35	
$a^3$	60.3	- 33	-21 31	18 32	327 6	

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$a^4$	-59 <sup>s</sup> 4	- 49''	-21° 49'	21° 2'	329° 36'	
$b^n$	30.9	-391				
$b^s$	30.0	-408	-28 1	66 21	14 55	$a$
$b^1$	30.0	-433	-30 1	67 25	15 59	$a^1$
$c$	3.5	+338	+24 27	71 38	20 12	
$c^1$	0.8	+342	+25 45	73 53	22 27	
$d$	+12.5	-647	-26 14	113 55	62 29	$b^1$
$e$	17.0	-485	-14 19	111 10	59 44	
$f$	23.0	-558	-16 51	119 44	68 18	$b$
$g$	26.8	-585	-17 24	124 51	73 25	$b^3$
$h$	29.5	-596	-17 17	128 23	76 57	
$i$	50.7	+ 54	+26 26	135 1	83 35	$c$
$i^1$	51.3	+ 47	+26 9	135 58	84 32	
$i^2$	52.0	+ 38	+25 48	137 15	85 49	

September 14 3 <sup>h</sup> 1 <sup>m</sup>						
$a^n$	-50.7	-224				
$a^s$	50.0	-238	-27 45	37 39	16 26	$a$
$a^1$	49.9	-268	-29 56	38 27	17 14	
$b^1$	14.3	-478	-25 46	81 46	60 33	
$b^2$	9.5	-530	-27 6	87 35	66 22	$c^1?$
$b$	3.8	-409	-17 10	88 56	67 43	$c$
$b^3$	+ 2.7	-450	-17 11	95 34	74 21	$c^3?$
$b^4$	2.7	-478	-18 53	96 28	75 15	$c^2$
$b^5$	3.3	-446	-16 43	95 57	74 44	$c^4$
$c^1$	25.2	+ 89	+20 58	101 37	80 24	$d$
$c$	30.3	+159	+26 43	105 27	84 14	$d^3$
$d$	36.0	-662	-19 39	139 12	117 59	$e$

September 15 2 <sup>h</sup> 56 <sup>m</sup>						
$a^n$	-56.8	-159				
$a^s$		-170	-27 39	24 43	17 29	$a$
$b$	35.1	+612	+24 41	23 48	16 34	$b^1$
$c^1$	21.8	-399	-24 6	72 3	64 49	
$c$	17.3	-314	-16 59	74 5	66 51	$c$
$c^2$	11.6	-392	-19 16	80 56	73 42	
$c^3$	11.1	-348	-16 25	80 14	73 0	
$c^4$	9.9	-362	-16 46	81 38	74 24	$c^1$
$d$	+11.1	+180	+21 5	85 31	78 17	$d$
$d^1$	14.1	+196	+23 5	87 49	80 35	$d^1$
$d^2$	14.9	+184	+22 43	88 52	81 38	$d^2$
$d^3$	19.2	+235	+27 14	91 41	84 27	$d^3$
$d^4$	24.1	+240	+29 21	96 30	89 16	$d^4$
$e$	27.2	-627	-19 37	124 45	117 31	$e$

September 16 2 <sup>h</sup> 38 <sup>m</sup>						
$a^n$	-61.1	-109				
$a^s$		-123	-27 55	12 19	18 57	$a$



Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1868 September 16—Continued						
$b^1$	-40.2	+664"	+24° 7'	9° 53'	16° 31'	$b$
$b$	36.9	+678	+26 43	13 38	20 16	
$c$	30.8	-225	-17 41	58 55	65 33	
$c^1$	22.8	-280	-17 21	67 32	74 10	
$d$	1.6	+262	+20 45	71 21	77 59	$c$
$d^1$	+ 2.2	+267	+22 32	74 28	81 6	$c^2?$
$d^2$	3.0	+260	+22 27	75 21	81 59	$c^3$
$d^3$	7.8	+308	+27 3	78 13	84 51	
$d^4$	14.7	+285	+28 26	85 13	91 51	$d$
$e$	16.2	-576	-19 54	110 16	116 54	
September 17 2 <sup>h</sup> 29 <sup>m</sup>						
$a$	-63.5	- 81	-28 25	359 24	19 59	$B$
$b$	42.6	-128	-17 43	43 45	64 20	
$c$	13.3	+350	+20 43	57 26	78 1	
$c^1$	12.5	+318	+19 18	59 14	79 49	
$c^2$	10.2	+341	+21 31	60 24	80 59	
$c^3$	3.7	+389	+26 55	64 20	84 55	
$d$	+ 4.1	-503	-19 46	95 49	116 24	$a^1$
September 21 22 <sup>h</sup> 40 <sup>m</sup>						
$a^1$	-42.0	-164	-19 52	41 33	116 2	$B$
$a$	41.2	-159	-19 9	42 25	116 54	
$a^2$	37.9	-202	-20 3	46 49	121 18	
$a^3$	37.6	-187	-19 0	46 53	121 22	
$b$	33.7	+684	+28 8	13 0	87 29	
$c^1$	1.3	-318	-10 54	82 7	156 36	
$c^2$	0.5	-333	-11 26	83 11	157 40	
$c$	+ 2.5	-363	-12 1	86 30	160 59	
September 26 2 <sup>h</sup> 35 <sup>m</sup>						
$a$	-58.5	-146	-28 54	10 43	157 40	$a$
$b$	54.0	+139	- 9 57	13 44	160 41	
$c^1$	31.2	-146	-14 1	47 30	194 27	
$c$	30.6	-156	-14 19	48 15	195 12	$b_1$
$c^2$	30.1	-165	-14 35	48 58	195 55	$b_2$
$c^3$	28.4	-239	-18 2	52 11	199 8	$b^1 b^2$
$d$	+35.8	-754	-25 5	138 19	285 16	$c$
September 28 23 <sup>h</sup> 16 <sup>m</sup>						
$a$	-61.3	+234	-10 13	350 5	163 9	$a$
$b_1^s$	50.6	+ 23	-14 50	20 22	193 26	
$b_2$	50.0	+ 7	-14 57	21 33	194 37	$a^1$
$b^1$	48.4	- 84	-19 10	25 38	198 42	$a^4$
$b^2$	47.5	- 65	-17 37	26 26	199 30	
Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
$c$	+22.0	-686"	-24° 21'	110° 45'	283° 49'	$b$
$d$	39.6	-661	-17 17	131 21	304 25	$c$
$e$	47.4	+141	+31 54	112 33	285 37	$e$
$f$	58.6	+211	+39 19	136 43	309 47	
$g$	62.2	+214	+39 23	154 22	327 26	$f$
September 29 2 <sup>h</sup> 21 <sup>m</sup>						
$a^s$	-58.3	+ 93	-14 52	4 19	193 13	$a^2$
$a^1$	57.9	+ 90	-15 5	5 28	194 22	
$a^2$	56.7	+ 46	-16 41	9 8	198 2	
$a^3$	56.2	+ 14	-18 10	10 43	199 37	
$a^4$	56.0	+ 28	-17 14	10 51	199 45	$a^3$
$b$	+11.4	-614	-23 42	95 27	284 21	
$b^1$	12.7	-628	-24 6	97 18	286 12	
$b^2$	13.4	-646	-24 58	98 55	287 49	
$b^3$	16.9	-673	-25 24	103 42	292 36	$a^4$
$c$	30.6	-621	-17 13	114 45	303 39	
$d$	33.5	+ 56	+22 11	95 16	284 10	$b$
$e$	52.6	+239	+39 39	120 59	309 53	$c$
$f^s$	60.0	+214	+39 25	140 16	329 10	$d$
October 1 23 <sup>h</sup> 44 <sup>m</sup>						
$a$	-13.0	-447	-23 37	66 28	281 54	$a$
$a^1$	12.0	-451	-23 26	67 27	282 53	$a^1$
$a^2$	10.3	-469	-23 47	69 28	284 54	$a^2$
$a^3$	4.7	-532	-24 28	77 50	293 16	$b$
$a^4$	+ 9.7	-503	-17 32	87 24	302 50	
$a^5$	9.9	-512	-17 58	87 58	303 24	
$b$	12.0	+223	+23 19	69 0	284 26	
$b^1$	12.7	+169	+20 37	71 2	286 28	$b^2$
$b^2$	14.5	+181	+21 59	72 21	287 47	
$b^3$	16.0	+183	+22 41	73 35	289 1	
$c$	39.2	+310	+39 26	96 26	311 52	
$c^1$	41.7	+308	+40 18	100 5	315 31	$c$
$d^s$	51.0	+248	+39 21	116 9	331 35	
$d$	51.5	+234				
October 3 1 <sup>h</sup> 56 <sup>m</sup>						
$a$	-37.6	-249	-23 29	36 38	281 32	$a$
$a^1$	37.1	-259	-23 49	37 21	282 15	$b$
$a^2$	34.7	-263	-22 50	39 58	284 52	
$b$	12.1	+411	+23 16	40 9	285 3	
$b^1$	9.7	+371	+22 12	43 47	288 41	
$b^2$	8.6	+370	+22 37	44 43	289 37	$c$
$c^s$	+35.4	+328	+39 29	89 14	334 8	
$c^1$	36.1	+339				
$d$	54.0	- 2	+25 23	118 52	3 46	

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1868 October 5 $0^h 13^m$						
a	-55.3	-84''	-23° 30'	8° 42'	280° 34'	
a <sup>1</sup>	53.6	-115	-24 18	12 0	283 52	
a <sup>2</sup>	51.3	-153	-25 13	16 6	287 58	
b	29.4	+575	+23 38	13 56	285 48	
c <sup>s</sup>	+18.3	+456	+40 3	64 27	336 19	b
c <sup>n</sup>	19.2	+467				
d <sup>s</sup>	24.6	-773	-29 5	114 10	26 2	a
d <sup>n</sup>	25.3	-767				
e	63.4	-115	+20 13	143 53	55 45	c
October 9 $23^h 35^m$						
a	-13.6	-521	-28 56	60 32	28 10	
b <sup>s</sup>	13.5	+740	+41 18	13 22	341 0	a
b <sup>n</sup>	12.2	+747				
c	+35.3	+21	+20 25	87 32	55 10	c
d	45.1	-72	+18 31	100 40	68 18	d
October 11 $0^h 1^m$						
a <sup>s</sup>	-22.4	+845	+41 43	347 10	343 7	
a <sup>n</sup>	21.6	+849				
b	+5.5	-479	-18 11	73 12	69 9	
c	11.6	+186	+20 26	59 33	55 30	
d	22.2	+78	+18 38	71 33	67 30	
e	35.8	-695	-20 32	115 7	111 4	
e <sup>1</sup>	36.5	-697	-20 27	116 27	112 24	
October 16 $23^h 39^m$						
a <sup>n</sup>	+5.8	-675	-31 4	77 9	143 3	a
a <sup>s</sup>		-684				
a <sup>1</sup>	7.9	-671	-29 35	78 32	144 26	a <sup>1</sup>
b <sup>1</sup>	14.2	-404	-10 56	72 43	138 37	
b <sup>2</sup>	15.8	-411	-10 43	74 20	140 14	
b	16.7	-439	-11 58	76 4	141 58	b <sup>3</sup>
b <sup>3</sup>	17.2	-393	-9 11	74 55	140 49	b
b <sup>4</sup>	17.2	-410	-10 9	75 29	141 23	b <sup>2</sup>
October 17 $23^h 51^m$						
a	-4.7	-609	-31 6	63 32	143 36	A
a <sup>1</sup>	2.7	-601	-29 40	64 56	145 0	
b <sup>1</sup>	1.6	-318	-12 14	56 21	136 25	
b	+4.2	-304	-9 13	60 33	140 37	
b <sup>2</sup>	4.2	-313	-9 43	60 49	140 53	
b <sup>3</sup>	4.6	-352	-11 44	62 17	142 21	
Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
October 24 $0^h 13^m$						
a <sup>1</sup>	-63.8	-139''	-31° 39'	330° 47'	149° 18'	
a	62.7	-164	-32 44	334 13	152 44	
		-171				
b <sup>n</sup>	10.8	-316	-16 24	42 21	220 52	a
b <sup>s</sup>	9.6	-325				
c <sup>s</sup>	+32.0	-703	-23 7	96 56	275 27	c
c <sup>n</sup>	32.8	-695				
c <sup>1</sup>	39.2	-685	-20 8	105 22	283 53	
c <sup>2</sup>		-704	-21 26	107 37	286 8	c <sup>4</sup>
c <sup>1</sup> <sub>1</sub>	40.2	-669	-18 50	105 11	283 42	c <sup>2</sup>
c <sup>2</sup> <sub>2</sub>	40.7	-660	-18 6	105 12	283 43	c <sup>4</sup>
c <sup>4</sup>	42.9	-671	-18 16	110 28	288 59	
d	53.6	+116	+30 19	93 46	272 17	d
October 27 $0^h 8^m$						
a <sup>s</sup>	-45.5	-53	-16 40	1 3	221 37	a
a <sup>n</sup>		-65				
b	2.3	+381	+24 17	26 38	247 12	b <sup>1</sup>
b <sup>1</sup>	+0.6	+385	+25 38	28 50	249 24	b <sup>2</sup>
b <sup>1</sup> <sub>1</sub>	2.2	+374	+25 40	30 32	251 6	b
b <sup>2</sup> <sub>2</sub>	2.6	+374	+25 50	30 53	251 27	
b <sup>3</sup>	3.4	+365	+25 58	31 49	252 23	
b <sup>4</sup>	5.8	+363	+26 29	33 56	254 30	b <sup>3</sup> ?
c <sup>s</sup>	2.3	-517	-22 55	55 31	276 5	c
c <sup>n</sup>	2.9	-508				
c <sup>1</sup>	8.0	-589	-25 30	63 5	283 39	c <sup>3</sup> ?
c <sup>2</sup> <sup>n</sup>	12.6	-499	-18 46	63 39	284 13	c <sup>2</sup>
c <sup>2</sup> <sub>s</sub>		-515				
c <sup>3</sup>	13.5	-508	-18 30	64 27	285 1	c <sup>4</sup>
c <sup>4</sup>	13.5	-546	-20 45	65 58	286 32	
c <sup>5</sup>	14.0	-573	-22 14	67 32	288 6	
c <sup>6</sup>	16.1	-566	-21 1	69 6	289 40	c <sup>7</sup>
c <sup>7</sup>	16.5	-497	-16 46	66 35	287 9	
c <sup>8</sup>	25.7	-557	-17 3	77 26	298 0	c <sup>9</sup>
c <sup>9</sup>	26.3	-591	-18 53	79 44	300 18	c <sup>10</sup>
c <sup>10</sup>	27.6	-562	-16 42	79 31	300 5	
c <sup>11</sup>	29.5	-597	-18 9	83 17	303 51	
d	23.9	+310	+30 35	51 42	272 16	d
d <sup>1</sup>	25.4	+310	+31 11	53 11	273 45	
d <sup>2</sup>	26.9	+313	+31 58	54 41	275 15	d <sup>2</sup>
d <sup>3</sup>	27.8	+273	+29 54	56 20	276 54	
d <sup>4</sup>	30.1	+285	+31 30	58 28	279 2	d <sup>4</sup>
d <sup>5</sup>	30.7	+308	+33 10	58 45	279 19	d <sup>5</sup>
e	58.0	-125	+17 1	100 52	321 26	f
October 29 $23^h 53^m$						
a <sup>n</sup>	-60.9	+72	-16 50	333 46	222 15	
a <sup>s</sup>		+65				

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1868 October 29—Continued						
$b^1$	-25 <sup>s</sup> .5	+550''	+23° 54'	357° 26'	245° 55'	
$b^2$	22.7	+541	+24 37	0 35	249 4	
$b$	20.0	+534	+25 25	3 26	251 55	
$b^3$	18.8	+516	+24 55	5 25	253 54	
$c$ n	22.0	-342	-23 3	27 54	276 23	
$c$ s		-349				
$c^1$	14.4	-296	-17 5	33 10	281 39	
$c^2$	12.4	-342	-18 56	35 58	284 27	
$c^3$	12.4	-458	-25 52	39 6	287 35	
$c^4$	11.2	-337	-18 11	36 49	285 18	
$c^5$	10.4	-326	-17 14	37 11	285 40	
$c^6$	9.2	-378	-19 46	39 33	288 2	$a^1$
$c^7$	8.3	-412	-21 25	41 13	289 42	
$c^8$	0.9	-376	-16 28	46 12	294 41	$a$
$c^9$	+ 3.2	-408	-16 44	50 22	298 51	
$c^{10}$	4.7	-451	-18 43	53 2	301 31	$a^5$
$d^1$	- 1.4	+479	+30 6	22 0	270 29	
$d$	- 0.4	+476	+30 21	22 59	271 28	
$d^2$	+ 2.3	+487	+32 8	24 55	273 24	
$d^3$	7.0	+460	+32 29	30 3	278 32	
$d^4$	8.4	+437	+31 42	32 5	280 34	$b^1$
$d^5$	8.9	+460	+33 14	31 44	280 13	$b^2$
$e$	39.4	+160	+27 10	68 37	317 6	$d$
$e^1$	43.2	+160	+28 30	73 7	321 36	
$f$	45.7	- 44	+17 37	79 12	327 41	
$f^1$ n		- 42				C
$f$ s	51.3	- 53	+19 8	86 26	334 55	
$g$ n		+ 30				
$g$ s	60.4	+ 18	+25 50	101 9	349 38	$e$
$g^1$	60.9	+ 21	+25 46	102 18	350 47	
$g^2$	64.2	+ 77	+29 46	111 57	0 26	
$h$	62.3	+257	+40 34	112 21	0 50	$f$
November 3 23 <sup>h</sup> 34 <sup>m</sup>						
$a^1$	-62.4	+ 25	-19 13	327 10	285 38	
$a$ n		+ 56				
$a$ s	-58.3	+ 44	-15 48	334 48	293 16	
$a^2$ n		+ 16				
$a^2$ s	57.3	+ 7	-17 28	337 16	295 44	
$a^3$	56.3	+ 9	-17 9	338 55	297 23	
$a^4$	55.1	- 30	-18 47	341 29	399 57	
$a^5$ n		- 21				
$a^5$ s	53.7	- 37	-18 5	343 30	301 58	
$b_1$	40.0	+748	+28 15	315 48	274 16	
$b_2$	39.2	+761	+29 19	314 51	273 19	
$b^1$	35.1	+769	+31 53	322 7	280 35	
$b^2$	33.4	+782	+33 30	323 4	281 32	
$c^1$	19.7	+391	+17 42	5 22	323 50	
$c_1$	17.6	+372	+17 29	7 49	326 17	
December 19 23 <sup>h</sup> 39 <sup>m</sup>						
$a$	-63.7	-395	-31 47	268 21	152 26	
$b$	+49.5	-648	-34 35	56 48	300 53	
December 24 0 <sup>h</sup> 16 <sup>m</sup>						
$a^1$	-32.0	+562	+29 48	305 40	260 17	
$a^2$	29.4	+547	+28 57	309 1	263 38	
$a^3$	25.2	+562	+30 15	312 52	267 29	
$a^4$	22.8	+563	+30 29	315 17	269 54	
$a$ n	22.5	+589				
$a$ s	20.6	+576	+31 43	316 15	270 52	
$b^1$	9.5	-288	-19 57	334 10	288 47	
$b$ s	8.2	-311	-21 20	336 2	290 39	
$b$ n	7.3					
$b^2$	4.6	-290	-19 49	338 38	293 15	
$c^1$	1.1	+464	+25 29	337 2	291 39	
$c^2$	+ 3.4	+448	+25 51	341 3	295 40	
$c$	4.5	+442	+24 32	342 6	296 43	
$c^3$	6.4	+478	+27 4	343 26	298 13	
$d$	16.8	-329	-20 23	357 14	311 51	
$d^1$	21.4	-320	-19 26	1 11	315 48	
$d^2$	22.8	-351	-21 11	2 54	317 31	
1869 January 7 23 <sup>h</sup> 45 <sup>m</sup>						
$a$ n	-66.4	+198	+11 12	254 41	45 28	
$a$ s		+180				
$b^1$	57.3	+503	+30 42	258 39	49 26	
$c_1$	51.7	+340	+18 45	277 3	67 50	
$c_2$	50.5	+345	+18 56	278 38	69 25	
$c^1$	49.2	+377	+20 53	279 30	70 17	
$c^2$	42.3	+427	+23 45	248 33	75 20	
$d^1$	35.1	+388	+20 33	295 26	86 13	
$d$ n	26.5	+377				
$d$ s	25.5	+366	+19 1	304 28	95 15	$a^1$
$d_1^2$	21.5	+381	+19 20	310 16	101 3	a
$d_2^2$	20.8	+377	+19 8	309 10	99 57	
$d_3^2$	20.5	+366	+18 25	309 32	100 19	



Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1869 January 7—Continued						
$e^1$	-7 <sup>s</sup> .2	+354"	+17° 14'	321° 7'	111° 54'	
$e^{\text{n}}$	+0.9	+315	+14 17	328 6	118 53	$b$
$e^{\text{s}}$	1.5	+304				
$e^2$	4.3	+315	+14 34	330 42	121 29	$b^1?$
January 10 0 <sup>h</sup> 6 <sup>m</sup>						
$a^1$	-59.3	+325	+19 47	262 37	95 43	
$a^2$	59.0	+305	+18 26	263 56	97 2	
$a$	57.0	+310	+18 27	267 8	100 14	
$b$	43.0	+268	+14 11	285 48	118 54	
$b^1$	41.9	+263	+13 47	287 1	120 7	
$c$	+37.5	+468	+23 16	0 38	193 44	$b$
$c^1$	41.2	+491	+24 51	5 36	198 42	
$c^2$	20.6	+473	+23 40	6 58	200 4	$b^2$
January 14 0 <sup>h</sup> 7 <sup>m</sup>						
$a$	-25.3	-458	-29 56	292 17	181 32	$b^1 b^2$
	23.7					
$a^1$	23.2	-480	-31 35	293 49	183 4	$b$
$a^2$	21.5	-497	-32 53	295 14	184 29	
$a^3$	21.0	-436	-29 0	297 4	186 19	
$a^4$	20.5	-456	-30 20	297 12	186 27	
$a^5$	19.4	-455	-30 23	298 15	187 30	$b^3$
$a^6$	18.1	-479	-32 3	299 3	188 18	
$b$	21.0	+429	+22 49	303 4	192 19	$a$
$b^1$	19.3	+418	+21 52	304 39	193 54	$a^1$
$b^2$	14.3	+448	+23 25	309 14	198 29	
$c^1$	9.7	-211	-16 19	310 14	199 29	
$c^2$	7.4	-195	-15 36	312 23	201 38	
$c$	6.1	-229	-17 40	313 10	202 25	$c$
$c^3$	5.5	-207	-16 24	313 50	203 5	
$d^{\text{n}}$	+32.4	+474	+21 41	352 31	241 46	$d$
$d^{\text{s}}$	33.6	+456				
$d^1$	34.6	+488	+23 10	354 51	244 6	$d^1$
$d^2$	38.7	+515	+24 55	0 14	249 29	$d^2$
$d^3$	39.8	+520	+25 16	1 32	250 47	$d^3$
$e^{\text{n}}$	62.8	-246				
$e^{\text{s}}$	-255	-20 56	28 9	277 24	$e$	
January 16 0 <sup>h</sup> 17 <sup>m</sup>						
$a$	-46.3	+370	+22 30	275 21	192 45	
$a^1$	45.6	+361	+21 48	276 26	193 50	
$b^1$	43.9	-535	-31 43	264 43	182 7	
$b^2$	43.1	-533	-31 45	266 3	183 27	
$b$	43.1	-542	-32 18	265 30	182 54	

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$b^3$	-41 <sup>s</sup> .0	-513"	-30° 51'	269° 55'	187° 19'	
$c$	35.3	-285	-17 54	283 44	201 8	
$d^{\text{n}}$	+4.3	+452	+21 21	324 42	242 6	
$d^{\text{s}}$	5.9	+436				
$d^1$	7.5	+475	+23 7	327 5	244 29	
$d^2$	13.3	+502	+24 32	332 44	250 8	
$d^3$	14.6	+510	+24 32	334 22	251 46	
$d^{\text{s}}$	15.5	+497				
$e^{\text{s}}$	46.2	-244		0 47	278 11	
$e^{\text{n}}$	47.1	-230	-21 45			
January 27 23 <sup>h</sup> 27 <sup>m</sup>						
$a$	-63.3	+309	+26 57	234 43	306 0	
$b^1$	+16.1	+435	+17 34	325 20	36 37	$b^1$
$b^{\text{n}}$	18.7	+433	+16 29	327 58	39 15	$b$
$b^{\text{s}}$	19.9	+416				
$b^2$	19.6	+358	+12 20	327 4	38 21	$b^3$
$b^3$	19.8	+457	+18 28	329 7	40 24	$b^5$
$b^4$	24.2	+364	+12 9	331 15	42 32	$b^6$
$c$	17.5	+554	+24 51	329 39	40 56	$b^4$
$c^1$	21.6	+585	+26 44	334 8	45 25	
$d^1$	33.8	+475	+16 48	341 1	52 18	
$d_1$	35.1	+448	+16 10	343 43	55 0	$c$
$d_2$	35.7	+448	+16 6	344 25	55 42	
$d^2$	36.2	+494	+19 1	346 24	57 41	
$d^3$	37.3	+446	+15 50	346 1	57 18	$c^5$
						$c^4?$
January 29 0 <sup>h</sup> 3 <sup>m</sup>						
$a$	-59.3	+254	+22 11	245 12	344 55	
$b^1$	15.8	+348	+17 12	295 0	34 43	
$b^2$	12.1	+313	+14 21	297 49	37 32	
$b^3$	11.8	+260	+11 6	297 31	37 14	
$b^{\text{s}}$	10.1	+332	+15 55	299 9	38 52	$a$
$b^{\text{n}}$	11.7	+353				
$b^4$	10.8	+480	+24 40	300 42	40 25	
$b^5$	9.9	+398	+19 12	300 39	40 22	$a^1$
$b^6$	6.3	+304	+12 44	302 39	42 22	
$c^1$	+6.4	+373	+14 47	314 12	53 55	$B$
$c^{\text{n}}$	7.0	+405	+16 23	315 59	55 42	
$c^{\text{s}}$	8.9	+401				
$c^2$	7.9	+440	+18 44	316 34	56 17	
$c^3$	9.6	+396	+15 43	317 15	56 58	
$c^4$	10.8	+389	+15 4	318 12	57 55	
$c^5$	11.4	+464	+19 41	320 4	59 47	
$c^6$	12.3	+419	+16 42	320 1	59 44	
$c^7$	13.7	+437	+17 38	321 35	61 18	
$d$	49.5	+503	+17 58	2 29	102 12	$d$
$d^1$	52.1	+523	+19 19	8 31	108 14	$d^2$

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1869 February 1 0 <sup>h</sup> 18 <sup>m</sup>						
$a^s$	-50.8	+167''	+15° 22'	256° 27'	38° 25'	$a$
$a^n$	49.9	+186				
$a^1$	49.1	+234	+18 32	258 5	40 3	
$b^1$	41.3	+241	+16 45	267 14	49 12	$b$
$b^2$	40.6	+251	+17 11	268 2	50 0	
$b^3$	38.55	+232	+15 28	270 6	52 4	
$b^4$	35.8	+267	+16 9	273 6	55 4	$c^1$
$b^5$	35.3	+287	+18 1	273 42	55 40	$c^2$
$b^6$	34.9	+239	+14 59	273 51	55 49	$c^3$
$b^7$	33.9	+261	+16 3	275 1	56 59	
$b$	33.4	+283	+17 17	275 36	57 34	$c$
$b^8$	32.8	+274	+16 35	276 7	58 5	
$c$	24.3	+488	+28 17	285 38	67 36	$d$
$c^1$	23.0	+511	+29 34	287 0	68 58	
$d$	+13.5	+448	+17 46	319 6	101 4	$f$
$d^1$	18.4	+497	+20 5	324 36	106 34	
$d^2$	20.7	+486	+19 1	326 27	108 25	$f^1$
$d^3$	27.1	+549	+22 8	334 35	116 33	$f^2$
$e$	13.7	+56	-5 25	313 14	95 12	$e^1$
$e^1$	16.7	+42	-6 43	315 37	97 35	$e^2$
$e^2$	19.5	+21	-8 22	317 48	99 46	
$e^3$	21.6	+50	-7 2	319 57	101 55	$e$
$f^s$	36.1	+680				$g g^1$
$f^n$	37.6	+667	+29 42	352 17	134 15	
$f^1$	38.1	+708	+32 17	357 30	139 28	
$f^2$	41.1	+673	+29 21	359 5	141 3	
February 2 0 <sup>h</sup> 2 <sup>m</sup>						
$a$	-58.8	+130	+15 37	243 5	38 55	
$b$	52.7	+179	+16 32	252 22	48 12	
$c^1$	47.2	+216	+17 6	259 30	55 20	
$c^2$	46.8	+242	+18 35	260 1	55 51	
$c^3$	46.3	+200	+15 51	260 32	56 22	
$c$	45.2	+228	+17 14	261 55	57 45	
$d$	37.2	+434	+28 14	271 1	66 51	
$e^1$	2.5	+16	-4 54	298 22	94 12	
$e^2$	+1.0	-2	-6 35	300 57	96 47	
$e$	6.2	+14	-6 38	305 29	101 19	
$f$	0.9	+409	+17 50	305 10	101 0	
$f^1$	7.2	+455	+19 10	312 55	108 45	$b^1$
$f^2$	13.4	+518	+22 5	319 48	115 38	$c$
$g$	27.6	+668	+30 5	339 33	135 23	$c^1$
$g^1$	28.2	+663	+29 38	339 54	135 44	
February 7 0 <sup>h</sup> 14 <sup>m</sup>						
$a$	-60.4	+128	+17 22	234 58	101 6	
$b^1$	50.0	+246	+21 6	251 9	117 17	
$b$	46.5	+278	+21 54	255 39	121 47	
Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
$c$	-33.0	+462''	+29° 34'	271° 35'	137° 43'	
$c^1$	31.8	+470	+29 44	272 54	139 2	
$d$	+13.8	-63	-13 4	305 44	171 52	
$d^1$	16.0	-35	-11 55	307 58	174 6	
$e$	22.5	+641	+27 38	328 42	194 50	$a$
$e^1$	25.8	+687	+30 22	334 42	200 50	
$e^2$	26.7	+672	+29 4	334 55	201 3	$a^1$
February 13 23 <sup>h</sup> 51 <sup>m</sup>						
$a$	-48.6	+328	+27 20	247 5	197 11	
$a^1$	45.7	+380	+29 38	250 54	201 0	
$a^2$	44.8	+390	+29 56	252 7	202 13	
$b^s$	+9.5	+517	+20 34	307 24	257 30	
$b^n$		+506				
$dot$	10.9	+512	+20 21	308 18	258 24	
$b^1$	11.3	+525	+21 5	309 2	259 8	
$b^2$	12.6	+515	+20 7	309 56	260 2	
$b^3$	14.0	+520	+20 6	311 19	261 25	
$c_1$	19.8	-261	-26 41	302 7	252 13	
$c_2$	20.6	-252	-26 20	303 1	253 7	
$c^1$	27.7	-239	-26 45	310 19	260 25	
$c^2$	28.7	-238	-27 24	311 17	261 23	
$c^3$	30.2	-242	-27 58	312 46	262 52	
$d$	47.2	-112	-23 32	333 8	283 14	
February 25 23 <sup>h</sup> 3 <sup>m</sup>						
$a^1$	-36.5	-685	-30 41	213 34	331 37	
$a$	33.8	-683	-31 57	217 40	335 43	$a$
$b$	8.2	+368	+16 7	278 0	36 3	
$c$	7.7	+576	+29 10	283 35	41 38	
$d$	+17.6	+687	+28 21	311 33	69 36	
$e^1$	21.5	-114	-19 57	293 6	51 9	$b^1$
$e_1$	25.7	-158	-23 41	296 24	54 27	$b_1$
$e_2$	26.7	-158	-23 57	297 20	55 23	$b_2$
$e^2$	27.2	-98	-20 38	298 47	56 50	
February 28 23 <sup>h</sup> 41 <sup>m</sup>						
$a^s$	-45.1	+118	+16 4	235 47	36 18	$a$
$a^n$		+125				
$a^1$	41.8	+174	+17 39	240 25	40 56	$a^1$
$a^2$	40.5	+174	+17 5	241 49	42 20	
$a^3$	38.9	+218	+19 1	244 11	44 42	$a^2$
$a^4$	38.2	+221	+18 54	244 57	45 28	
$b^1$	15.0	-342	-20 41	252 24	52 55	
$b^2$	12.2	-315	-20 14	255 42	56 13	
$b_1$	10.4	-382	-24 37	255 6	55 37	$b_1$
$b_2$	9.6	-382	-24 55	255 48	56 19	$b_2$
$c$	+0.6	+661	+31 53	291 35	92 6	
$c^1$	2.4	+683	+32 48	294 12	94 43	

Letter	$\Delta\alpha$	$\Delta\delta$	h	L	L'	Letter on next date
1869 March 1 23 <sup>h</sup> 20 <sup>m</sup>						
<i>a</i>	-53 <sup>s</sup> .6	+ 51''	+16° 14'	222° 30'	36° 51'	<i>a</i>
<i>a</i> <sup>1</sup>	51.6	+ 95	+17 44	226 11	40 32	
<i>a</i> <sup>2</sup>	48.4	+146	+19 12	231 6	45 27	
<i>b</i> <sup>1</sup>	29.9	-439	-19 57	233 51	48 12	
<i>b</i> <sup>2</sup>	26.8	-425	-20 29	237 29	51 50	
<i>b</i> <sup>3</sup>	24.7	-418	-20 57	239 46	54 7	
<i>b</i> <sup>4</sup>	22.1	-386	-20 16	243 26	57 47	
<i>b</i> <sub>1</sub>	20.9	-465	-25 2	241 18	55 39	} <i>b</i>
<i>b</i> <sub>2</sub>	20.3	-465	-25 17	241 51	56 12	
<i>c</i>	+41.5	+734	+25 55	348 5	162 26	<i>d</i>
March 3 2 <sup>h</sup> 50 <sup>m</sup>						
<i>a</i>	-64.2	- 77	+16 17	192 33	37 1	
<i>b</i>	36.9	-624	-26 3	212 12	56 40	
<i>c</i>	+ 2.0	+573	+25 9	286 50	131 18	
<i>c</i> <sup>1</sup>	3.9	+593	+25 46	289 17	133 45	
<i>d</i> <sup>n</sup>	26.9	+715	+25 49	318 2	162 30	<i>a</i> <sub>1</sub> <i>a</i> <sub>2</sub>
<i>d</i> <sub>s</sub>	27.7	+695				
<i>d</i> <sup>1</sup>	30.1	+730	+26 53	323 38	168 6	<i>a</i> <sup>3</sup>
<i>d</i> <sup>2</sup>	31.0	+699	+24 25	322 9	166 37	
<i>d</i> <sup>3</sup>	32.7	+713	+24 53	326 33	171 1	<i>a</i> <sup>5</sup>
	34.0	+713				
<i>d</i> <sup>4</sup>	34.5	+728	+25 44	329 52	174 20	<i>a</i> <sup>6</sup>
March 9 2 <sup>h</sup> 51 <sup>m</sup>						
<i>a</i> <sub>1</sub>	-40.3	+294	+25 31	235 5	163 46	<i>a</i>
<i>a</i> <sub>2</sub>	39.3	+299	+25 20	236 17	164 58	
<i>a</i> <sup>1</sup>	38.5	+313	+25 49	237 23	166 4	<i>a</i> <sub>2</sub> <sup>1</sup>
<i>a</i> <sub>s</sub> <sup>2</sup>	37.6	+343	+26 23	238 38	167 19	<i>a</i> <sub>1</sub> <sup>1</sup>
		+329				
<i>a</i> <sup>3</sup>	36.2	+343	+26 34	240 26	169 7	
<i>a</i> <sup>4</sup>	33.5	+357	+26 12	243 30	172 11	<i>a</i> <sup>3</sup>
<i>a</i> <sup>5</sup>	31.5	+359	+25 22	245 36	174 17	
<i>a</i> <sup>6</sup>	30.7	+368	+25 53	245 50	174 31	<i>a</i> <sup>4</sup>
<i>b</i>	+25.4	-169	-25 17	283 6	211 47	<i>E</i>
<i>c</i>	39.5	+689	+20 49	328 47	257 28	<i>j</i>
<i>d</i> <sup>1</sup>	48.0	+ 40	-20 2	312 0	240 41	
<i>d</i>	48.4	+ 30	-20 42	312 24	241 5	
March 12 0 <sup>h</sup> 24 <sup>m</sup>						
<i>a</i>	-61.1	+ 84	+25 1	196 24	165 45	
<i>a</i> <sub>1</sub> <sup>1</sup>	60.3	+123	+26 48	198 45	168 6	
<i>a</i> <sub>2</sub> <sup>1</sup>	60.3	+100	+25 22	198 44	168 5	
<i>a</i> <sup>2</sup>	58.7	+157	+27 50	202 40	172 1	
<i>a</i> <sup>3</sup>	57.9	+141	+26 16	204 28	173 49	
<i>a</i> <sup>4</sup>	57.1	+160	+26 53	206 20	175 41	
Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
<i>b</i>	-38 <sup>s</sup> .2	-572''	-21° 9'	205° 4'	174° 25'	
<i>b</i> <sup>1</sup>	35.5	-554	-21 39	209 43	179 4	
<i>c</i>	25.5	+313	+20 5	247 49	217 10	<i>a</i>
<i>c</i> <sup>1</sup>	24.7	+321	+20 13	248 43	218 4	
<i>c</i> <sup>2</sup>	21.5	+344	+20 12	252 10	221 31	
<i>c</i> <sup>3</sup>	18.7	+341	+18 51	254 31	223 52	
<i>d</i> <sup>1</sup>	11.3	+587	+31 17	267 43	237 4	<i>b</i>
<i>d</i> <sup>2</sup>	9.6	+591	+30 48	269 24	238 45	
<i>d</i>	9.1	+618	+32 28	270 49	240 10	<i>b</i> <sup>1</sup>
<i>e</i>	2.4	-371	-26 24	249 24	218 45	<i>c</i> <sub>1</sub> <i>c</i> <sub>2</sub> ?
<i>e</i> <sup>1</sup>	0.7	-351	-25 58	251 33	220 54	<i>c</i> <sup>1</sup>
<i>e</i> <sup>2</sup>	+ 1.5	-385	-28 46	252 22	221 43	<i>e</i>
<i>j</i> <sup>1</sup>	10.6	+607	+23 43	287 58	257 19	
<i>j</i>	12.0	+574	+21 5	287 49	257 10	<i>d</i>
<i>g</i>	39.1	+719	+22 43	329 35	298 56	<i>g</i>
March 16 0 <sup>h</sup> 0 <sup>m</sup>						
<i>a</i> <sub>s</sub> <sup>n</sup>	-60.3	+ 0 - 9	+19 58	193 21	218 38	<i>a</i>
		+240				
<i>b</i>	53.2	+233	+29 57	209 55	235 10	<i>b</i>
<i>b</i> <sup>1</sup>	50.9	+272	+30 53	213 50	239 5	
<i>c</i> <sub>1</sub>	39.8	-680	-24 44	187 47	213 2	} <i>c</i>
<i>c</i> <sub>2</sub>	39.3	-676	-24 49	189 9	214 24	
<i>c</i> <sup>1</sup>	36.1	-647	-25 18	197 12	222 27	
<i>d</i>	36.9	+242	+21 26	231 31	256 46	
<i>e</i>	31.9	-680	-29 10	199 26	224 41	<i>e</i>
<i>f</i>	30.5	-454	-18 24	216 34	241 49	<i>d</i>
<i>f</i> <sup>1</sup>	28.0	-436	-18 39	219 55	245 10	
<i>g</i>	+ 3.7	+557	+23 2	276 14	301 29	<i>f</i>
<i>g</i> <sub>1</sub> <sup>1</sup>	7.8	+552	+21 8	279 35	304 50	<i>f</i> <sub>1</sub> <sup>1</sup>
<i>g</i> <sub>2</sub> <sup>1</sup>	8.5	+550	+20 45	280 7	305 22	<i>f</i> <sub>2</sub> <sup>1</sup>
<i>g</i> <sub>3</sub> <sup>1</sup>	9.0	+548	+20 26	280 28	305 43	<i>f</i> <sub>3</sub> <sup>1</sup>
<i>g</i> <sup>2</sup>	14.2	+607	+22 12	287 38	312 53	<i>f</i> <sup>2</sup>
<i>h</i>	29.9	- 69	-21 14	282 24	307 39	<i>g</i> <sup>1</sup>
<i>h</i> <sup>1</sup>	32.4	- 46	-21 0	285 19	310 34	<i>g</i> <sup>3</sup>
<i>h</i> <sup>2</sup>	34.0	- 55	-22 1	286 47	312 2	<i>g</i> <sup>4</sup>
<i>h</i> <sup>3</sup>	34.2	- 78	-23 25	286 39	311 54	<i>g</i> <sup>5</sup>
<i>i</i>	52.5	- 97	-30 2	310 51	336 6	<i>h</i>
March 17 0 <sup>h</sup> 3 <sup>m</sup>						
<i>a</i>	-63.6	- 62	+19 39	179 32	218 51	
<i>b</i>	59.4	+165	+29 41	195 48	235 7	<i>a</i>
<i>c</i>	41.2	-729	-25 20	173 48	213 7	
<i>d</i>	39.2	-532	-18 3	201 28	240 47	<i>b</i>
<i>e</i>	36.0	-731	-29 6	186 12	225 31	
<i>f</i> <sub>s</sub> <sup>n</sup>	8.6	+485 +478	+23 17	262 21	301 40	<i>c</i>
<i>f</i> <sub>1</sub> <sup>1</sup>	4.6	+469	+20 53	265 20	304 39	<i>c</i> <sub>1</sub> <sup>1</sup>



Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1869 March 17—Continued						
$f_2^1$	-3.8	+471"	+20° 41'	266° 4'	305° 23'	$c_2^1$
$f_3^1$	3.3	+467	+20 13	266 21	305 40	$c_3^1$
$f_1^2$	+1.2	+534	+22 25	272 40	311 59	$c^2$
$f_2^2$	2.0					
$g^1$	16.1	-146	-20 55	266 37	305 56	$d^1$
$g$	16.1	-165	-21 58	266 10	305 29	$d^2$
$g^2$	18.7	-105	-19 34	269 55	309 14	
$g^3$	22.2	-93	-20 10	273 22	312 41	$d^3$
$g^4$	23.0	-121	-22 1	273 31	312 50	$d^0$
$g^5$	23.7	-137	-23 10	273 50	313 9	$d^9$
$g^6$	24.8	-93	-21 6	275 50	315 9	$d^7$
$h$	44.4	-137	-30 12	297 10	336 29	
March 18 0 <sup>h</sup> 44 <sup>m</sup>						
$a$	-63.0	+111	+29 28	182 35	236 20	
$b$	44.2	-598	-18 13	187 39	241 24	
$c$	21.2	+387	+23 14	248 1	301 46	$a$
$c_n$		+396				
$c_1^1$	17.4	+374	+20 33	250 49	304 34	
$c_2^1$	16.5	+371	+19 59	251 31	305 16	
$c_3^1$	16.0	+374	+19 55	252 4	305 49	
$c^2$	11.0	+437	+21 35	258 2	311 47	
$d$	+2.1	-159	-21 45	250 24	304 9	$c$
$d^1$	2.9	-231	-20 32	251 53	305 38	
$d^2$	3.3	-266	-22 38	251 18	305 1	
$d^3$	4.9	-229	-21 12	253 38	307 23	
$d^4$	7.7	-183	-19 48	257 18	311 3	
$d^5$	10.0	-174	-20 10	259 28	313 13	
$d^6$	11.5	-195	-21 54	260 17	314 2	$c^4$
$d^7$	12.5	-176	-21 13	261 36	315 21	
$d^8$	12.5	-199	-22 30	261 2	314 47	$c^5$
$d^9$	12.5	-218	-23 33	260 32	314 17	$c^6$
$e$	5.9	+534	+20 41	275 27	329 12	$b^2$
$f$	32.4	-2	-18 38	284 6	337 51	$e^1$
$f^1$	33.6	-25	-20 19	284 54	338 39	$e$
March 21 0 <sup>h</sup> 39 <sup>m</sup>						
$a$	-51.5	+131	+23 2	206 54	302 42	$a$
$b$	35.4	+217	+19 43	227 47	323 35	$b$
$b^1$	31.7	+309	+23 25	233 18	329 6	$b^1$
$b^2$	29.3	+276	+20 18	234 57	330 45	$b^2?$
$c$	31.2	-516	-21 47	207 35	303 23	$c$
$c_n$	29.4	-542				
$c^1$	27.3	-446	-18 56	214 55	310 43	$c^2$
$c^2$	25.6	-491	-22 4	214 18	310 6	$c^3$
$c^3$	23.5	-457	-21 15	217 57	313 45	$c^4$
$c^4$	21.5	-455	-22 4	219 52	315 40	$c^5$
$c^5$	20.6	-455	-22 28	220 41	316 29	$c^6$
March 25 0 <sup>h</sup> 22 <sup>m</sup>						
$a$	-63.1	-51	+20 51	173 33	325 19	$a?$
$b$	46.2	+95	+18 29	209 30	1 16	
$c$	+6.1	-196	-19 39	248 28	40 14	
$d^1$	22.3	+764	+29 38	297 40	89 26	
$d^2$	23.7	+756	+28 40	298 9	89 55	
$d^3$	24.1	+773	+29 41	300 38	92 24	
$d$	25.7	+758	+28 0	301 15	93 1	
March 28 0 <sup>h</sup> 34 <sup>m</sup>						
$a$	-63.0	-76	+19 37	170 26	4 25	
$b$	20.7	+424	+25 44	239 44	73 43	
$b^2$	19.0	+416	+24 26	241 3	75 2	
$b$	18.0	+459	+26 38	243 10	77 9	
$b^3$	16.3	+459	+25 1	244 40	78 39	
$c$	10.4	-290	-17 44	228 49	62 48	
$c^1$	7.7	-251	-16 48	232 20	66 19	
$c^2$	7.7	-302	-19 32	230 39	64 38	
$c^3$	5.8	-279	-19 7	233 2	67 1	
$d^1$	+13.5	+588	+21 12	274 59	108 58	$b?$
$d$	15.8	+610	+21 41	278 6	112 5	

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1869 April 1 3 <sup>h</sup> 5 <sup>m</sup>						
a	-56.2	-121''	+12° 42'	182° 50'	74° 25'	a
a <sup>1</sup>	55.3	- 72	+14 46	185 53	77 28	
a <sup>2</sup>	53.2	- 44	+15 5	190 0	81 35	
b	36.7	+174	+18 45	214 47	106 22	
c	+17.1	+656	+24 15	277 50	169 25	
d	62.3	+ 30	-25 20	317 55	209 30	
April 10 22 <sup>h</sup> 45 <sup>m</sup>						
a	-60.0	+ 53	+24 53	170 33	185 55	a
b	5.5	-253	-17 3	221 22	236 44	
b <sup>1</sup>	+ 1.0	-251	-19 38	226 43	242 5	b <sup>1</sup> ?
c	41.9	+ 44	-18 47	272 5	287 27	
d <sup>1</sup>	52.2	+ 84	-19 45	286 33	301 55	b <sup>4</sup>
d <sub>1</sub>	53.1	+ 56	-21 38	287 34	302 56	
		+ 54				b
d <sub>2</sub>	54.3	+ 42	-22 24	289 22	304 44	
April 13 0 <sup>h</sup> 8 <sup>m</sup>						
a	-33.7	-534	-19 15	181 15	239 32	A
b <sup>1</sup>	+12.1	-150	-18 21	235 50	294 7	b
b <sub>2</sub> <sup>n</sup>	18.1	-119	-19 43	242 14	300 31	b <sup>2</sup>
b <sub>2</sub> <sup>s</sup>	19.5	-136				
b <sup>3</sup>	20.4	-171	-22 45	242 35	300 52	b <sup>3</sup>
b <sup>4</sup>	23.1	- 93	-19 24	246 50	305 7	b <sup>4</sup>
b <sub>n</sub>	23.1	-110	-21 32	247 4	305 21	b <sub>1</sub> b <sub>2</sub>
b <sub>s</sub>	25.1	-138				
b <sup>5</sup>	26.2	-108	-21 26	249 26	307 43	b <sub>3</sub>
b <sup>6</sup>	27.3	-201	-27 10	248 30	306 47	
c	30.4	+708	+23 42	284 22	342 39	c
c <sup>1</sup>	31.2	+702	+23 4	284 47	343 4	
April 15 22 <sup>h</sup> 55 <sup>m</sup>						
a	-46.1	-628	-17 18	152 36	238 14	a <sup>1</sup> a <sup>2</sup> a <sup>5</sup>  a <sub>1</sub> a <sub>2</sub>  a <sup>6</sup>
a <sup>1</sup>	45.2	-614	-17 14	156 40	242 18	
a <sup>2</sup>	45.2	-634	-18 7	153 54	239 32	
a <sup>3</sup>	42.6	-648	-20 16	157 27	243 5	
b <sup>1</sup>	10.9	-320	-18 4	209 52	295 30	
b <sup>2</sup>	8.0	-308	-18 39	212 39	298 17	
b <sup>3</sup>	4.4	-341	-21 48	214 32	300 10	
b <sup>4</sup>	2.2	-297	-20 28	217 48	303 26	
b <sup>5</sup>	0.1	-214	-16 49	222 12	307 50	
b <sup>6</sup>	+ 1.2	-265	-20 7	221 37	307 15	
b <sub>1</sub>	0.4	-288	-21 3	220 14	305 52	
b <sub>2</sub> <sup>n</sup>	1.0	-285	-21 54	220 54	306 32	
b <sub>2</sub> <sup>s</sup>	2.0	-302				
b <sub>3</sub> <sup>n</sup>	2.7	-269	-21 37	222 57	308 35	
b <sub>3</sub> <sup>s</sup>	3.8	-285				
April 18 23 <sup>h</sup> 0 <sup>m</sup>						
a <sup>1</sup>	-38.9	-583	-19 8	167 2	294 49	a   <

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1869 April 25—Continued						
$d$	+45 <sup>s</sup> .5	+605''	+14° 26'	285° 33'	154° 31'	$c$
$d^2$	47.1	+611	+14 28	289 50	158 48	$c^3$
$e$	54.4	- 44	-25 49	272 21	141 19	$D$
April 29 22 <sup>h</sup> 41 <sup>m</sup>						
$a$ <sup>n</sup> <sub>s</sub>	-61.7	-107 -118	+14 50	145 59	67 57	$aa^1$
$b^1$	4.7	-133	- 9 35	207 18	129 16	
$b$	3.6	-116	- 9 8	208 39	130 37	
$c^1$	0.4	+273	+11 3	221 0	142 58	
$c$ <sup>s</sup> <sub>n</sub>	+ 5.7 7.0	+379 +400	+15 15	229 47	151 45	
$c^2$	10.1	+384	+13 34	232 41	154 39	
$c^3$	13.9	+446	+15 49	237 55	159 53	
$c^4$	13.9	+407	+13 33	236 35	158 33	
$d$ <sup>n</sup> <sub>s</sub>	5.9 7.2	-320 -338	-24 45	211 8	133 6	
$d^1$	10.0	-315	-25 16	214 30	136 28	
$d^2$	10.6	-336	-26 45	214 30	136 28	
$d^3$	13.3	-272	-24 3	218 31	140 29	
$d^4$	18.1	-272	-25 51	222 48	144 46	
$d^5$	18.6	-294	-27 19	222 42	144 40	
$d$ <sup>s</sup> <sub>n</sub>	19.6	-272 -255	-25 57	224 22	146 20	
$e^1$	23.4	+678	+26 48	257 56	179 54	
$e$	24.4	+674	+26 12	258 42	180 40	
$f^1$	28.4	+705	+26 51	265 41	187 39	
$f$	29.3	+700	+26 13	266 17	188 15	
$g$	39.2	+667	+20 54	276 57	198 55	$c?$
May 6 23 <sup>h</sup> 56 <sup>m</sup>						
$a$	-64.3	-116	+14 45	132 7	153 4	$a$
$a^1$	63.9	-102	+15 18	134 6	155 3	
$b$	52.2	+139	+23 53	161 8	182 5	
$b^1$	48.7	+174	+24 29	166 21	187 18	
$b^2$	45.0	+188	+23 46	171 12	192 9	
$b^3$	44.3	+202	+24 20	172 12	193 9	
$c$ <sup>n</sup> <sub>s</sub>	42.7 41.7	-701 -718	-26 26	129 53	150 50	
$d$ <sup>n</sup> <sub>s</sub>	33.5 32.7	+294 +283	+25 0	185 47	206 44	$b$
$d^1$	28.7	+329	+25 44	190 51	211 48	$b^1$
$e^1$	13.7	-308	-15 37	188 34	209 31	$c^1$
$e$ <sup>s</sup> <sub>n</sub>	12.3	-287 -269	-14 24	190 24	211 31	
$e^2$	9.5	-225	-12 29	194 25	215 22	
$e^3$	8.8	-248	-14 2	194 23	215 20	

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
$e^4$	- 8 <sup>s</sup> .4	-227''	-12° 59'	195° 15'	216° 12'	$c^3$
$f$	5.9 5.1	+463	+25 6	214 53	235 50	$d$
$f^1$	1.3	+519	+27 3	220 16	241 13	$d^2$
$f^2$	+ 3.9	+550	+27 6	225 54	246 51	$d^4$
$g$	- 2.8	-383	-23 50	195 16	216 13	$c^4$
$g^1$	+ 3.5	-379	-25 56	200 47	221 44	
$h$	17.1	-308	-26 40	214 36	235 33	$e$
$h^1$	18.9	-296	-26 38	216 33	237 30	$e^3$
$h^2$	22.3	-301	-28 9	219 39	240 36	$e^5$
$i$ <sup>s</sup> <sub>n</sub>	48.8 49.8	+ 49 + 63	-16 1	254 36	275 33	$f$
$i^1$	51.5	+ 68	-15 58	257 43	278 40	$f^2$
$i^2$	52.5	+ 61	-16 40	259 5	280 2	$f^4$
$i^3$	52.5	+ 93	-14 50	259 42	280 39	
$i^4$	53.8	+ 71	-16 27	261 10	282 7	
$k$ <sup>n</sup> <sub>s</sub>	64.6	+ 25 + 14	-22 7	284 2	304 59	$g$
May 8 23 <sup>h</sup> 53 <sup>m</sup>						
$a$	-64.3	+ 49	+23 50	133 47	182 46	$a$
$b$	52.6	+160	+25 7	158 43	207 42	
$b^1$	49.0	+207	+26 30	164 11	213 10	
$b^2$	42.8	+111	+18 9	170 38	219 37	
$c$	37.6	-448	-15 9	158 57	207 56	$c$
$c^1$	35.7	-456	-15 44	161 2	210 1	
$c^2$	34.8	-413	-13 44	164 1	213 0	$c^1$
$c^3$	32.3	-374 -383	-12 45	167 53	216 52	$c^3$
$c^4$	25.5	-512	-22 46	168 26	217 25	
$d$	30.0	+317	+25 36	187 11	236 10	$b^1$
$d^1$	26.8	+335	+25 26	190 40	239 39	$b$
$d^2$	24.9	+360	+26 17	192 54	241 53	$b^3$
$d^3$	24.3	+381	+27 22	193 53	242 52	
$d^4$	19.3	+408	+27 9	199 7	248 6	
$d^5$	18.8	+428	+28 12	200 4	249 3	
$e$	9.9	-463	-25 50	184 42	233 41	$d_1 d_2$
$e^1$	7.3	-449	-25 58	187 29	236 28	$d^1$
$e^2$	6.0	-463	-27 17	188 3	237 2	
$e^3$	5.4	-424	-25 11	189 58	238 57	
$e^4$	3.9	-443	-26 52	190 36	239 35	
$e^5$ <sup>n</sup> <sub>s</sub>	1.6 0.4	-443 -454	-28 18	192 57	241 56	$d^3 d^4$
$f$ <sup>n</sup> <sub>s</sub>	+26.4 27.9	- 75 - 86	-16 28	226 31	275 30	$e$
$f^1$	28.5	- 70	-16 18	227 58	276 57	$e^1$
$f^2$	29.5	- 63	-16 14	229 5	278 4	
$f^3$	29.9	- 16	-13 41	230 23	279 22	$e^2$
$f^4$ <sup>n</sup> <sub>s</sub>	30.5 31.6	- 44 - 68	-16 20	230 42	279 41	$e^3$
$f^5$	34.7	- 58	-17 36	334 12	283 11	$e^4$



1869 May 8—Continued

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
$f^6$	+42.8	-21"	-18° 0'	243° 25'	292° 24'	$f$
$g^{\text{n}}$	53.3	-23	-21 37	256 51	305 50	$h$
$h^{\text{n}}$	60.7	-32	-24 36	270 5	319 4	$k$
$h^1$	61.8	-44	-24 49	272 49	321 48	$k^1$
$h^2$	62.3	-84	-27 23	274 21	323 20	$k^2$
$h^3$	63.3	-63	-26 19	277 7	326 6	$k^3$
$h^4$	64.1	-53	-25 51	279 41	328 40	$k^4$

May 10 0<sup>h</sup> 24<sup>m</sup>

$a$	-64.3	+88	+25 45	132 12	209 33	$a$
$b^1$	52.6	+175	+25 46	156 53	234 14	
$b$	51.7	+182	+25 51	158 10	235 31	
$b^2$	51.4	+215	+27 48	158 48	236 9	
$b^3$	50.7	+189	+25 52	159 40	237 1	$c$
$c$	51.1	-557	-15 24	129 42	207 3	
$c^1$	50.4	-524	-13 58	135 0	212 21	
$c^2$	49.3	-542	-15 23	135 21	212 42	
$c^3$	48.7	-501	-13 29	140 12	217 33	$c^1$
$d_1^{\text{n}}$	30.8	-593	-26 7	156 7	233 38	
$d_2$	29.8	-593	-25 59	157 49	235 10	
$d^1$	28.6	-576	-25 28	160 8	237 29	
$d^2$	24.1	-571	-26 54	165 0	242 21	$c^2$
$d^3$	24.0	-600	-28 41	163 23	240 44	
$d^4$	23.2	-581	-27 51	165 18	242 39	
$d^5$	22.1	-584	-27 40	166 57	244 18	
$e^{\text{n}}$	0.9	-235	-16 12	197 17	274 38	$d_1$
$e^1$	+1.1	-238	-16 35	199 2	276 23	
$e^2$	2.1	-182	-13 45	201 14	278 35	
$e_1^{\text{n}}$	3.7	-205	-16 13	202 14	279 35	
$e_2^{\text{n}}$	4.8	-221	-16 50	202 48	280 9	$d_2$
$e_3^{\text{n}}$	5.1	-219	-16 50	202 48	280 9	
$e^4$	7.5	-224	-17 55	204 40	282 1	
$f$	19.1	-156	-17 50	216 0	293 21	
$f^1$	21.8	-157	-18 45	218 19	295 40	$e^2$
$g^1$	26.6	+629	+25 11	246 37	223 58	
$g$	27.9	+662	+26 54	250 16	327 37	
$h^{\text{n}}$	32.4	-133	-21 22	228 57	306 18	
$i$	41.2	+631	+20 51	265 0	342 21	$i$
$i^1$	44.6	+655	+21 33	274 11	351 32	
$k^{\text{n}}$	43.4	-119	-24 4	241 30	318 51	
$k^1$	46.4	-126	-24 47	244 23	321 44	
$k^2$	47.2	-161	-27 9	245 5	322 26	$h^2$

$k^3$	+48.3	-138"	-26° 5'	246° 42'	324° 3'	$h^4$
$k^4$	51.2	-114	-25 30	250 55	328 16	
$k_5^{\text{n}}$	52.2	-105	-25 59	252 27	329 48	$h^6$
$l$	-23.6	+435	+30 43	193 25	270 46	

May 12 0<sup>h</sup> 19<sup>m</sup>

$a$	-64.6	+96	+25 55	129 23	234 47	$a$
$b^1$	46.9	+293	+30 46	163 16	268 40	
$b$	45.5	+291	+30 4	165 8	270 32	
$b^2$	42.9	+307	+30 3	168 34	273 58	
$b^3$	42.1	+326	+30 58	169 41	275 5	$a^2$
$b^4$	41.7	+342	+31 52	170 16	275 40	
$c$	42.8	-683	-26 14	129 3	234 27	
$c^1$	38.6	-688	-28 18	136 23	241 47	
$c^2$	36.9	-683	-28 43	139 41	245 5	$a^3$
$c^3$	35.8	-705	-30 29	138 42	244 6	
$c^4$	34.4	-685	-29 53	143 4	248 28	
$d^1$	29.1	-385	-14 34	167 8	272 32	
$d_1^{\text{n}}$	26.0	-390	-16 33	170 8	275 32	$b$
$d_2$	24.7	-404	-16 44	171 19	276 43	
$d^2$	24.2	-393	-16 44	171 19	276 43	
$d^3$	23.6	-356	-14 50	173 10	278 34	
$d_1^{\text{n}}$	21.4	-367	-16 40	174 27	279 51	$b^1$
$d_2^{\text{n}}$	20.3	-376	-17 6	175 23	280 47	
$e$	+2.1	+506	+26 3	216 15	321 39	
$e^1$	3.9	+538	+27 27	218 59	324 23	
$e^2$	7.3	+558	+27 34	222 44	328 8	$c^1$
$f^{\text{n}}$	7.3	-272	-21 0	201 40	307 4	
$f_1^{\text{n}}$	8.0	-288	-21 0	201 40	307 4	
$g$	8.9	-399	-28 33	199 46	305 10	
$g^1$	10.8	-392	-28 48	201 42	307 6	$e$
$g^2$	15.2	-358	-28 14	206 30	311 54	
$g^3$	16.2	-367	-29 8	207 11	312 35	
$h_1^{\text{n}}$	19.3	-247	-23 41	213 5	318 29	
$h_2$	21.4	-252	-23 54	214 22	319 46	$f$
$h^1$	23.8	-205	-21 53	217 35	322 59	
$h^2$	23.8	-256	-24 55	216 32	321 56	
$h^3$	27.1	-279	-27 24	219 19	324 43	
$h^4$	31.6	-231	-25 58	224 35	329 59	$f^4$
$h^5$	31.7	-242	-26 38	224 26	329 50	
$h_6^{\text{n}}$	33.2	-219	-26 14	226 16	331 40	
$i^{\text{n}}$	22.8	+549	+21 21	236 48	342 12	
$i_1^{\text{n}}$	24.0	+540	+21 21	236 48	342 12	$g$
$i^1$	27.0	+556	+20 56	240 53	346 17	
$i^2$	29.4	+612	+23 43	246 29	351 53	
$i^3$	30.3	+594	+22 17	246 21	351 45	

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1869 May 14 4 <sup>h</sup> 2 <sup>m</sup>						
a	-62.1	+191"	+30° 19'	133° 42'	269° 19'	
a <sup>1</sup>	61.8	+200	+31 10	133 51	269 28	
a	59.3	+197	+29 26	140 32	276 9	
a <sup>3</sup>	58.1	+223	+30 37	142 47	278 24	
b <sup>n</sup>	45.3	-530	-17 52	139 58	275 35	
b <sup>s</sup>	44.1	-546				
b <sup>1</sup>	44.8	-512	-16 25	141 45	277 22	
b <sup>2</sup>	42.7	-523	-17 46	143 49	279 26	
b <sup>3</sup>	41.9	-534	-18 40	144 7	279 44	
b <sup>4</sup>	41.3	-530	-18 41	145 13	280 50	
c	26.6	+359	+27 7	184 35	320 12	
c <sup>1</sup>	25.9	+349	+26 12	185 9	320 46	
c <sup>2</sup>	24.4	+334	+24 44	186 16	321 53	
c <sup>3</sup>	23.8	+368	+26 40	187 26	323 3	
c <sup>4</sup>	22.4	+329	+23 44	188 2	323 39	
c <sup>5</sup>	21.0	+400	+27 43	190 40	326 17	
c <sup>6</sup>	19.6	+398	+27 5	191 55	327 32	
c <sup>7</sup>	18.1	+421	+28 2	193 47	329 24	
d <sup>n</sup>	19.5	-449	-22 8	171 45	307 22	
d <sup>s</sup>	18.7	-460				
e <sup>1</sup>	18.1	-564	-29 3	167 47	303 24	
e	17.3	-552	-28 40	169 5	304 42	
e <sup>2</sup>	16.5	-543	-28 21	170 21	305 58	
e <sup>3</sup>	10.2	-539	-30 21	176 16	311 53	
e <sup>4</sup>	8.8	-528	-30 10	178 0	313 37	
f <sup>s</sup>	8.7	-439	-24 55	182 51	318 28	
f <sup>n</sup>	5.9	-428				
f <sup>1</sup>	3.3	-433	-26 15	186 19	321 56	
f <sup>2</sup>	1.3	-428	-26 37	188 13	323 50	
f <sup>3</sup>	0.1	-405	-25 38	189 57	325 34	
f <sup>4</sup>	+1.1	-456	-29 10	189 24	325 1	
f <sup>5</sup>	2.5	-430	-28 3	191 28	327 5	
f <sup>6</sup>	6.9	-421	-29 0	195 36	331 13	
f <sup>6</sup> <sub>1</sub>	6.9	-403				
f <sup>6</sup> <sub>2</sub>	8.0	-384	-27 30	196 50	332 27	b?
g <sup>s</sup>	4.5	+362	+19 45	204 56	340 33	a
g <sup>n</sup>	3.3	+371				
g <sup>1</sup>	1.4	+398	+19 57	210 5	345 42	
g <sup>2</sup>	5.1	+466	+22 54	215 15	350 52	
May 20 23 <sup>h</sup> 21 <sup>m</sup>						
a	-64.8	+53	+21 9	122 51	339 55	
b <sup>n</sup>	45.5	-654	-26 3	121 48	338 52	
b <sup>s</sup>	44.6	-663				
b <sup>1</sup>	43.2	-685	-28 17	221 30	338 34	
c	25.9	+288	+22 23	177 52	34 56	a
c <sup>1</sup>	20.8	+322	+23 1	183 10	40 14	
c <sup>2</sup>	20.8	+315	+22 35	183 2	40 6	
d	+65.7	-56	-22 39	270 28	127 32	c <sup>1</sup>
d <sup>1</sup>	66.2	-72	-23 42	272 44	129 48	c <sup>2</sup> c
May 22 3 <sup>h</sup> 38 <sup>m</sup>						
a	-50.8	+148"	+21° 40'	147° 2'	34° 41'	a?
b	+4.1	-447	-29 4	186 2	73 41	
c <sup>1</sup>	51.9	-144	-23 51	239 38	127 17	b <sup>1</sup>
c <sup>2</sup>	52.9	-151	-24 34	241 16	128 55	b <sup>3</sup>
c	54.0	-153	-24 59	242 50	130 29	b
May 23 3 <sup>h</sup> 49 <sup>m</sup>						
a	-54.2	+183	+24 46	141 9	42 57	
b <sup>1</sup>	+41.8	-188	-23 31	225 48	127 36	b <sup>3</sup>
b <sup>2</sup>	43.6	-160	-22 17	228 0	129 48	b <sup>4</sup>
b <sup>3</sup>	43.6	-204	-24 59	227 45	129 33	b <sup>5</sup>
b	44.5	-202	-25 8	228 54	130 42	b
b <sup>4</sup>	47.4	-197	-25 36	232 34	134 22	b <sup>6</sup>
b <sup>5</sup>	56.5	-211	-28 57	246 27	148 15	b <sup>7</sup> ?
May 24 3 <sup>h</sup> 31 <sup>m</sup>						
a	-14.9	-318	-15 38	171 35	86 49	
b <sup>1</sup>	+13.3	-288	-21 36	195 56	111 20	b <sup>3</sup>
b <sup>2</sup>	14.4	-306	-22 59	196 40	112 4	
b <sup>3</sup>	30.3	-239	-23 15	212 16	127 40	c
b <sup>4</sup>	32.3	-221	-22 42	214 29	129 53	
b <sup>5</sup>	32.3	-258	-25 0	214 7	129 31	
b	33.4	-253	-24 59	215 18	130 44	c <sup>4</sup>
b <sup>6</sup>	36.5	-248	-25 31	218 34	133 58	
b <sup>7</sup>	45.6	-248	-28 3	229 18	144 42	d?
c	43.1	+696	+29 31	262 26	177 50	e <sup>1</sup> e <sup>2</sup>
d <sup>n</sup>	46.8	+665				
d <sup>s</sup>	47.6	+654	+26 2	266 51	182 15	e
May 27 22 <sup>h</sup> 48 <sup>m</sup>						
a	-34.0	-580	-26 28	140 40	95 39	
b <sup>1</sup>	29.2	-454	-20 1	151 52	106 51	
b <sup>2</sup>	27.7	-443	-19 45	153 45	108 44	
b <sup>3</sup>	24.7	-459	-21 31	156 1	111 0	
b	24.2	-429	-19 51	157 34	112 33	
c <sup>1</sup>	10.6	-370	-19 54	171 26	126 25	
c <sup>2</sup>	8.5	-344	-19 28	173 26	128 33	
c <sup>n</sup>	7.2	-397	-22 44	173 33	128 32	
c <sup>s</sup>		-406				
c <sup>3</sup>	5.8	-347	-19 45	176 4	131 3	
c <sup>4</sup>	3.4	-408	-24 10	176 41	131 40	b
d	+13.9	-388	-27 35	192 26	147 25	
e <sup>1</sup>	23.8	+611	+29 53	224 30	179 29	c <sup>1</sup>
e <sup>2</sup>	24.4	+620	+30 20	225 39	180 38	
e <sup>n</sup>	29.4	+598	+26 30	229 52	184 51	c
e <sup>s</sup>	31.0	+573				
f <sup>1</sup>	39.4	+477	+17 20	234 31	189 30	
f <sup>1</sup>	41.3	+510	+18 53	238 34	193 33	d

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date	Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1869 May 27—Continued													
$g^1$	+54.9	-14"	-15° 4'	239° 54'	194° 53'	$e^1$	$c^s$	32.9	+312"	+26° 13'	158° 57'	187° 22'	
$g^2$	55.8	-2	-14 34	241 20	196 19	$e$	$c^n$	30.9	+331				
$g^3$	56.5	+23	-13 15	242 34	197 33		$d^1$	34.0	+155	+16 20	155 37	184 2	
$g^4$	58.2	0	-15 0	245 3	200 2	$e^2$	$d^2$	33.2	+158	+16 20	156 26	184 51	
$g^n$		+28					$d^3$	29.2	+155	+15 13	160 15	188 40	
$g_s$	61.6	+19	-14 24	251 33	206 32	$e^3$	$d^n$	26.1	+227	+17 49	163 59	192 24	
May 31 4 <sup>h</sup> 4 <sup>m</sup>							$d_s$	24.9	+207				
$a$	-63.0	+153	+23 29	116 42	130 54		$d^4$	24.3	+195	+16 31	165 7	193 32	
$b$	47.2	-593	-24 44	117 23	131 35	$a$	$d^5$	23.2	+188	+15 50	166 2	194 27	
$c^1 n$	24.7	+413	+30 4	168 17	182 29	$c^1 c^2$	$e^1$	13.4	-322	-16 16	165 51	194 16	
$c^2 s$	24.1	+404					$e^2$	12.4	-310	-15 46	166 59	195 24	
$c^2$	24.3	+347	+26 0	167 49	182 1	$c^2$	$e_1$	10.3	-287	-14 52	169 15	197 40	
$c^3$	21.5	+410	+29 25	171 10	185 22		$e_2$	8.9	-287	-15 11	170 25	198 50	
$c^s$	20.4	+365				$c$	$e^3$	7.3	-276	-14 53	171 59	200 24	
$c^n$	18.8	+377	+26 22	172 33	186 45		$e^4$	1.9	-243	-14 8	177 5	205 30	
$d^1$	19.1	+207	+17 39	169 37	183 49	$d^1$	$e^5$	1.4	-250	-14 40	177 22	205 47	
$d^2$	18.3	+216	+16 23	171 45	185 57	$d^2$	$f^1$	+24.6	-227	-19 11	200 4	228 29	
$d^3$	14.8	+269	+18 46	175 28	189 40		$f^2$	31.8	-317	-26 31	206 20	234 45	
$d^4$	12.5	+239	+16 25	177 4	191 16		$f$	33.7	-250	-22 42	208 39	237 4	
$d^n$	11.8	+280				$d$	$f^3$	34.5	-352	-29 28	209 3	237 28	
$d_s$	10.7	+264	+18 7	178 38	192 50	$d^4 ? d^5$	$f^4$	35.1	-347	-29 17	209 47	238 12	
$d^5$	9.3	+250	+16 18	179 59	194 11	$e^1$	$f^5$	42.3	-296	-27 42	218 4	246 29	
$e^1$	+1.5	-257	-15 49	180 28	194 40	$e^2$	$f^6$	45.5	-335	-31 4	222 21	250 46	
$e$	2.7	-248	-15 33	181 37	195 49	$e_1$	$f^7$	47.5	-287	-28 23	224 40	253 5	
$e^2$	5.3	-220	-14 15	183 24	197 36	$e^4 e^5$	$f^8$	47.5	-365	-33 40	225 40	254 5	
$e^3$	13.5	-183	-14 11	191 44	205 56		$f^9$	48.4	-287	-28 36	225 55	254 20	
$f^1$	38.9	-165	-18 57	215 27	229 39		$g^1$	42.9	+602	+26 21	241 46	270 11	
$f^2$	43.4	-266	-26 20	220 12	234 24		$g^n$		+564	+22 20	250 24	278 49	$c$
$f$	45.1	-220	-23 50	222 15	236 27		$g_s$	49.8	+555				
$f^3$	45.1	-329	-30 56	222 41	236 53		$g^2$	52.0	+568	+22 5	256 13	284 38	
$f^4$	50.0	-317	-30 20	223 43	237 55		$h$	51.3	+613	+25 11	262 51	291 16	
$f^5$	52.0	-266	-28 28	231 50	246 2		$i^n$	60.0	-84	-18 54	242 40	271 5	$d$
$f^6$	54.5	-312	-32 11	236 51	251 3		$i_s$		-98				
$f^7$	55.9	-269	-29 37	238 16	252 28		$k$	67.0	+32	-12 58	260 41	289 6	
$g^1$	49.3	+624	+25 56	258 38	272 50		June 9 22 <sup>h</sup> 59 <sup>m</sup>						
$g$	53.3	+575	+21 52	263 2	277 14		$a$	-46.9	-634	-30 27	106 15	243 47	
$h^n$		-58					$b^1$	43.6	-611	-29 17	116 3	253 35	
$h_s$	65.7	-68	-18 51	257 0	271 12		$b$	42.3	-621	-30 21	116 36	254 8	
June 1 4 <sup>h</sup> 22 <sup>m</sup>							$b^2$	41.5	-579	-27 38	121 19	258 51	
$a$	-50.9	-610	-25 12	104 35	133 0		$c^1$	39.9	+287	+25 2	141 33	279 5	
$b$	41.2	+183	+19 43	148 27	176 52		$c^n$		+273				
$b^1$	40.5	+209	+21 10	149 17	177 42		$c_s$	38.5	+266	+23 39	143 11	280 43	$a$
$c_1^1$	36.0	+370	+30 28	154 39	183 4		$c^2$	37.6	+333	+27 37	143 59	281 31	
$c_2^1$	35.6	+360	+29 42	155 2	183 27		$c^3$	36.5	+264	+22 56	145 18	282 50	$a^1$
$c^2$	35.7	+315	+26 45	154 52	183 17		$c^4$	32.5	+289	+23 47	149 31	287 3	
$c^3$	32.3	+367	-29 19	158 41	187 6		$d_s$	37.6	-424	-18 6	134 35	272 7	$b$
							$d^n$	36.8	-415				
							$e$	+14.1	+359	+19 35	192 24	329 56	
							$e^1$	19.4	+379	+19 50	197 34	335 6	$e^1 ?$
							$f$	18.4	-236	-16 44	187 49	325 21	$d$



Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date	Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date	
1869 June 9—Continued							June 16 2 <sup>h</sup> 41 <sup>m</sup>							
$j^1$	+22 <sup>s</sup> 2	-223''	-16° 38'	191° 19'	328° 51'	} f h	a	-64 <sup>s</sup> 0	+164''	+18° 54'	98° 30'	336° 26'		
$j^2$	26.7	-195	-15 44	195 34	333 6		a <sup>1</sup>	61.6	+180	+19 41	103 44	341 40		
$j^3$	28.4	-202	-16 30	197 9	334 41		b	42.9	+230	+20 46	130 31	8 27		
$g^1$	34.5	-363	-27 56	202 46	340 18		c	18.7	+284	+21 6	154 51	32 47		
g	35.3	-332	-26 3	203 39	341 11		d <sup>1</sup>	+12.4	-287	-17 32	176 14	54 10		
h	46.6	+485	+21 16	230 41	8 13	} f h	d	15.6	-268	-16 47	179 9	57 5		
$i^{\text{ n}}$	50.5	-84	-13 51	221 2	358 34		e	41.6	-261	-20 12	204 22	82 18		
$s$	-98						e <sup>1</sup>	42.7	-266	-20 42	205 38	83 34		
k	54.4	+474	+19 3	243 8	20 40		f	46.4	-383	-29 6	211 44	89 40		
l	56.1	-104	-15 43	228 39	6 11		f <sup>1</sup>	47.0	-378	-28 51	212 28	90 24		
m	57.6	-335	-30 57	235 19	12 51	} l <sup>1</sup>	$g_1^{\text{ n}}$	51.0	-247	-21 18	215 58	93 54		
n	65.6	-167	-21 37	249 36	27 8		$s$	-261						
n <sup>1</sup>	65.6	-134	-19 31	248 28	26 0		g <sub>2</sub>	51.8	-243	-20 43	216 55	94 51		
							h	68.0	-67	-12 43	249 7	127 3		
June 12 0 <sup>h</sup> 21 <sup>m</sup>							July 17 0 <sup>h</sup> 3 <sup>m</sup>							
a	-63.5	+202	+22 44	102 36	283 3	} a <sup>1</sup> a b <sub>1</sub> b <sub>2</sub> c d e	a	-54.1	+337	+19 12	78 23	29 51		
a <sup>1</sup>	62.7	+200	+22 32	104 30	284 57		a <sup>1</sup>	50.2	+551	+20 29	84 8	35 36	a	
b	58.4	-471	-18 59	94 16	274 43		b	9.4	+280	+22 28	146 2	97 30	b	
c	40.5	-494	-22 56	125 24	305 51		b <sup>1</sup>	13.3	+257	+21 26	149 28	100 56		
c <sup>1</sup>	38.7	-502	-23 43	127 10	307 37		b <sup>2</sup>	15.1	+261	+21 39	151 19	102 47		
c <sup>2</sup>	32.1	-553	-28 11	132 30	312 57		b <sup>3</sup>	17.9	+280	+23 0	154 0	105 28		
d	25.9	-367	-17 6	144 58	325 25		c <sub>1</sub>	20.7	+487	-24 29	161 32	113 0	c <sub>1</sub>	
d <sup>1</sup>	21.3	-317	-14 43	150 9	330 36		c <sub>2</sub>	21.7	-481	-24 2	162 25	113 53	c <sub>2</sub>	
e <sup>1</sup>	24.1	+243	+19 19	154 7	334 34		c <sub>3</sub>	21.7	-492	-24 48	162 38	114 6		
e	22.1	+262	+20 11	156 6	336 33		c <sup>1</sup>	25.5	-508	-25 46	166 51	118 19	c <sup>3</sup>	
e <sup>2</sup>	18.2	+289	+21 15	159 48	340 15		c <sup>2</sup>	26.0	-508	-25 44	167 23	118 51	c <sup>4</sup>	
f	4.5	-471	-27 17	162 11	342 38		c <sup>3</sup>	27.9	-498	-24 57	169 8	120 36		
g <sub>1</sub>	+8.8	-236	-14 32	176 57	357 24		d <sup>1</sup>	+27.5	+164	+22 28	163 17	114 45	d <sup>1</sup>	
g <sub>2</sub>	10.0	-225	-14 2	178 7	358 34		a	d	30.3	+252	+21 50	166 0	117 28	d
h	12.9	+368	+21 5	188 12	8 39		b <sub>1</sub> b <sub>2</sub>	d <sup>2</sup>	30.8	+298	+24 46	166 56	118 24	d <sup>2</sup>
i	27.4	+372	+18 52	201 34	22 1		c	e	36.7	+298	+24 58	173 21	124 49	
k	35.4	+431	+20 54	211 15	31 42		d	f	38.2	-270	-9 42	175 26	126 54	e <sup>1</sup>
l <sup>1</sup>	40.7	-239	-20 5	206 49	27 16		e	f <sup>1</sup>	38.8	-273	-9 53	176 6	127 34	
l	43.2	-264	-22 8	209 43	30 10		e	f <sup>2</sup>	41.0	-259	-8 58	178 13	129 41	
							f <sup>3</sup>	41.4	-303	-11 43	179 26	130 54	e	
							f <sup>4</sup>	42.4	-323	-12 59	180 58	132 26	e <sub>3</sub> <sup>1</sup>	
a <sup>1</sup>	-22.9	-319	-14 43	146 58	357 6	} b	g	47.1	+130	+14 43	183 36	135 4	f <sup>2</sup> f <sup>1</sup>	
a	21.3	-305	-14 5	148 39	358 47		g <sup>1</sup>	50.3	+128	+14 36	187 42	139 10	f <sup>2</sup> ?	
b <sub>1</sub>	17.4	+284	+12 53	158 9	8 17		h	49.1	-364	-15 39	190 30	141 58	g	
b <sub>2</sub>	16.7	+282	+20 39	158 47	8 55		July 18 0 <sup>h</sup> 7 <sup>m</sup>							
b <sup>1</sup>	14.2	+273	+19 43	160 57	11 5		a	-56.4	+389	+21 7	70 5	35 37	} A	
c	1.9	+299	+19 31	171 56	22 4	b	1.7	+281	+21 46	134 58	100 30			
d	+8.9	+349	+21 1	182 1	32 9	b <sup>1</sup>	+1.7	+286	+22 22	137 58	103 30			
e	15.2	-356	-22 39	179 51	29 59	b <sup>2</sup>	2.4	+274	+21 41	138 42	104 14			
f	61.4	-183	-19 26	233 46	83 54	b <sup>3</sup>	3.8	+246	+20 3	140 5	105 37			
g	61.7	-326	-29 0	240 25	90 33	} f g <sub>1</sub> g <sub>2</sub>	c <sub>1</sub>	6.7	-474	-24 19	147 16	112 48	c <sub>1</sub>	
h <sup> s</sup>	64.8	-211	-21 20	243 2	93 10									
n	-192													

1869 July 18—Continued

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
$c_2$	+ 7 <sup>s</sup> .3	-473''	-24° 12'	147° 48'	113° 20'	$c_2$
$c^1$	8.3	-468	-23 46	148 43	114 15	
$c^2$	12.1	-466	-23 22	152 11	117 43	$c^1$
$c^3$	13.1	-507	-26 8	153 44	119 16	
$c^4$	14.5	-508	-26 7	155 6	120 38	
$c^5$	15.6	-501	-25 33	156 3	121 35	$c^4$
$d^1$	13.1	+265	+21 56	148 27	113 59	$d^1$
$d$	17.0	+258	+21 45	152 5	117 37	$d^2$
$d^2$	17.7	+304	+24 42	152 43	118 15	
$e^1$	24.3	-274	-10 11	161 0	126 32	$e$
$e^2$	28.2	-279	-10 19	164 42	130 14	$e^1$
$e_1$	28.6	-299	-11 33	165 24	130 56	
$e_2$	29.2	-308	-12 5	166 2	131 34	
$e_3$	29.7	-320	-12 49	166 44	132 16	$e^2$
$f$	34.2	+128	+14 37	168 24	133 56	$f$
$f^1$	35.1	+133	+14 58	169 23	134 55	
$f^2$	37.1	+121	+14 18	171 25	136 57	$f^1$
$g$	38.4	-367	-15 33	176 34	142 6	
$h$	59.3	-351	-14 57	207 30	173 2	$g_1, g_2$

July 20 23<sup>h</sup> 38<sup>m</sup>

$a$	-30.6	+350	+22 52	104 25	97 44	$b$
$a^1$	29.9	+364	+23 50	104 48	98 7	
$a^2$	25.9	+356	+23 53	109 4	102 23	
$a^3$	25.1	+281	+19 21	111 22	104 41	
$a^4$	21.1	+279	+19 42	115 9	108 28	
$b^1$	29.5	-237	-12 27	111 43	105 2	$a$
$b$	28.5	-235	-12 11	112 40	105 59	
$b^2$	22.5	-249	-12 19	118 19	111 38	$a^1, a^2$
$c_1$	21.5	-423	-23 32	119 15	112 34	$c$
$c_2$	21.1	-421	-23 20	119 39	112 58	
$c^1$	14.9	-437	-23 41	125 33	118 52	
$c^2$	12.4	-500	-27 46	128 2	121 21	
$c^3$	11.7	-457	-24 40	128 37	121 56	$c^1$
$c^4$	10.7	-462	-24 55	129 34	122 53	
$d^1$	15.4	+320	+22 54	119 52	113 11	
$d^2$	12.1	+290	+21 25	123 19	116 38	
$d$	9.7	+299	+22 14	125 27	118 46	$e?$
$e$	6.3	-244	-10 1	132 29	125 48	$d$
$e^1$	1.8	-253	-10 26	136 22	129 41	
$e^2$	+ 0.8	-286	-12 42	138 51	132 10	$f$
$f$	5.9	+156	+14 55	140 24	133 43	$g$
$f^1$	10.6	+140	+14 19	144 35	137 54	$g^1$
$g_1$	42.0	-378	-15 38	179 18	172 37	
$g_2$	42.7	-373	-15 18	180 0	173 19	
$h$	59.9	-384	-16 45	210 33	203 52	$h$

July 22 3<sup>h</sup> 34<sup>m</sup>

$a$	$n$	-55 <sup>s</sup> .8	-144''	-12° 30'	79° 26'	103° 7'	$a$
$a_s$		-170					
$a_1^1$	$s$	49.0	-196	-13 32	88 45	112 26	
$a_2^1$	$n$	48.4	-190	-13 2	89 36	113 17	
$b$		51.5	+415	-22 19	73 3	96 44	$b$
$c$		46.6	-367	-24 16	90 4	113 45	
$c^1$		40.5	-395	-24 59	97 28	121 9	
$d$		37.6	-179	-10 27	101 46	125 27	
$e$		35.9	+338	+20 45	96 36	120 17	$c$
$f$		30.5	-246	-13 30	109 0	132 41	
$g$		25.2	+210	+14 40	110 3	133 44	
$g^1$		21.2	+181	+13 29	114 6	137 47	
$h$		+42.7	-408	-16 34	179 20	203 1	$c$
$i$		43.2	+116	+15 36	174 10	197 51	

July 27 23<sup>h</sup> 4<sup>m</sup>

$a$	-66.1	- 86	-12 32	52 0	115 10
$b$	63.5	- 60	- 9 40	62 2	125 12
$c$	+ 5.3	-357	-15 39	139 23	202 33
$d$	60.8	-355	-12 35	208 36	271 46
$e$	63.5	+160	+19 14	205 59	269 9

August 18 23<sup>h</sup> 56<sup>m</sup>

$b$	-54.9	- 68	-14 39	54 38	95 7	$a$
$c$	51.3	+467	+16 25	38 56	79 25	
$c^1$	50.9	+499	+17 43	37 26	77 55	
$c^2$	48.5	+546	+21 14	37 38	78 7	
$d$	20.3	+394	+23 37	81 9	121 38	$a$
$d^1$	19.4	+389	+23 36	82 10	122 39	
$d^2$	16.7	+410	+25 42	84 1	124 30	
$e$	13.6	-312	-15 4	102 25	142 54	
$e^1$	10.3	-359	-17 1	106 8	146 37	$B$
$e^2$	9.9	-348	-16 13	106 17	146 46	
$e^3$	8.6	-371	-17 17	107 50	148 19	
$f$	+ 4.8	+366	+26 52	96 25	136 54	
$g$	$n$	5.0	+107			$d$
$g_s$		6.0	+ 93	+14 22	110 52	
$g^1$		8.3	+123	+16 5	113 15	
$g^2$		9.9	+ 88	+14 29	115 18	
$g^3$		15.7	+138	+18 50	119 41	$d^3$
$h^1$		6.5	-513	-22 12	124 24	$d^4$
$h$		8.9	-511	-21 25	126 32	$e^1$
$h^2$		11.1	-548	-23 19	129 41	$e^2$
$h^3$		12.7	-566	-24 8	131 48	$e^3$
$i$		18.6	-469	-16 19	134 13	$e^4$
$i^1$		19.3	-485	-17 10	135 21	$f$
$k$		30.6	-563	-19 51	149 51	$f^1$
$k^1$		34.7	-566	-19 17	154 44	$g$
						$g^2$

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1869 August 19 0 <sup>h</sup> 5 <sup>m</sup>						
<i>a</i>	-30.2	+470''	+24° 26'	67° 1'	121° 37'	
<i>a</i> <sup>1</sup>	29.9	+490	+25 40	66 20	120 56	
<i>a</i> <sup>2</sup>	29.5	+465	+24 25	68 3	122 39	
<i>a</i> <sup>3</sup>	27.6	+490	+26 31	68 46	123 22	
<i>b</i>	26.6	-227	-13 57	88 28	143 4	
<i>b</i> <sup>1</sup>	26.1	-239	-14 31	89 6	143 42	
<i>b</i> <sup>2</sup>	24.2	-248	-14 28	91 0	145 36	
<i>b</i> <sup>3</sup>	23.3	-290	-16 43	92 31	147 7	
<i>b</i> <sup>4</sup>	22.2	-292	-16 30	93 33	148 9	
<i>c</i>	16.2	+438	+27 26	82 22	136 58	<i>b</i>
<i>d</i> <sup>1</sup>	10.5	+156	+12 52	95 24	150 0	
<i>d</i> <sup>s</sup>	9.4	+183				<i>a</i>
<i>d</i> <sup>n</sup>	8.6	+195	+15 10	95 59	150 35	
<i>d</i> <sup>2</sup>	7.3	+188	+15 37	97 28	152 4	
<i>d</i> <sup>3</sup>	4.5	+153	+14 24	100 38	155 14	
<i>d</i> <sup>4</sup>	+ 3.6	+211	+20 1	106 30	161 6	
<i>e</i> <sup>1</sup>	- 7.6	-447	-21 47	109 22	163 58	
<i>e</i>	6.4	-454	-21 49	110 34	165 10	
<i>e</i> <sup>2</sup>	5.3	-452	-21 26	111 32	166 8	
<i>e</i> <sup>3</sup>	2.2	-500	-23 41	115 24	170 0	
<i>e</i> <sup>4</sup>	+ 0.1	-493	-22 33	117 15	171 51	
<i>f</i>	5.2	-411	-15 54	119 46	174 22	
<i>f</i> <sup>1</sup>	6.1	-429	-16 46	121 2	175 38	
<i>g</i> <sup>n</sup>	18.2	-519	-19 52	135 17	189 53	<i>d</i>
<i>g</i> <sup>s</sup>	19.1	-535				
<i>g</i> <sup>1</sup>	22.6	-513	-18 2	138 37	193 13	
<i>g</i> <sup>2</sup>	24.6	-538	-19 13	141 32	196 8	
<i>g</i> <sup>3</sup>	25.7	-547	-19 35	142 59	197 35	<i>d</i> <sup>1</sup>
<i>h</i>	56.3	+359	+41 7	177 14	231 50	<i>g</i>
<i>h</i> <sup>1</sup>	57.7	+377	+42 10	184 7	238 43	
<i>h</i> <sup>2</sup>	57.7	+329	+39 10	179 12	233 48	<i>g</i> <sup>2</sup>
<i>h</i> <sup>3</sup>	58.1	+361	+41 8	184 8	238 44	<i>g</i> <sup>3</sup>
August 22 23 <sup>h</sup> 2 <sup>m</sup>						
<i>a</i> <sup>n</sup>	-42.6	+392	+14 30	53 54	149 59	<i>b</i>
<i>a</i> <sup>s</sup>		+383				
<i>b</i>	40.4	+601	+26 47	42 20	138 25	<i>c</i>
<i>c</i>	38.7	+485	+21 21	53 27	149 32	
<i>c</i> <sup>1</sup>	35.7	+460	+21 10	58 19	154 24	<i>d</i>
<i>d</i> <sup>n</sup>	19.2	-358				
<i>d</i> <sup>s</sup>	18.2	-374	-20 5	95 25	191 30	<i>e</i>
<i>d</i> <sup>1</sup>	11.6	-397	-19 42	102 25	198 30	
<i>e</i> <sub>1</sub>	12.3	-234	- 9 59	98 42	194 47	<i>f</i>
<i>e</i> <sub>2</sub>	11.6	-230	- 9 31	99 16	195 21	
<i>e</i> <sup>1</sup>	6.8	-246	- 9 2	103 36	199 41	
<i>f</i>	+ 0.6	+158	+16 1	101 28	197 33	<i>g</i>
<i>f</i> <sub>1</sub>	4.0	+137	+15 56	105 17	201 22	<i>g</i> <sup>1</sup>
<i>g</i> <sup>1</sup>	31.8	+257	+30 34	130 23	226 28	
<i>g</i>	37.4	+399	+41 22	137 41	233 46	
Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
<i>g</i> <sup>2</sup>	+38.3	+381''	+40° 21'	138° 50'	234° 55'	<i>h</i>
<i>g</i> <sup>3</sup>	43.5	+388	+42 4	147 6	263 11	<i>h</i> <sup>2</sup>
August 23 0 <sup>h</sup> 3 <sup>m</sup>						
<i>a</i> <sup>1</sup>	-52.6	-200	-22 56	54 25	165 8	
<i>a</i>	47.6	-216	-21 41	61 48	172 31	
<i>b</i> <sup>s</sup>		+440				<i>a</i>
<i>b</i> <sup>n</sup>	49.5	+449	+14 13	39 29	150 12	
<i>c</i>	44.1	+646	+26 47	28 43	139 26	
<i>c</i> <sup>1</sup>	40.8	+694	+30 54	28 17	139 0	
<i>d</i>	43.0	+526	+21 26	43 49	154 32	
<i>e</i> <sup>n</sup>	31.9	-289	-20 10	81 9	191 52	<i>b</i>
<i>e</i> <sup>s</sup>	31.1	-301				
<i>e</i> <sup>1</sup>	29.1	-285	-18 40	83 24	194 7	
<i>f</i> <sup>s</sup>	27.3	-155	- 9 51	83 13	193 56	<i>c</i>
<i>f</i> <sup>n</sup>	26.8	-144				
<i>f</i> <sup>1</sup>	23.2	-185	-10 36	87 20	198 3	<i>c</i> <sup>1</sup>
<i>f</i> <sup>2</sup>	21.2	-165	- 8 46	88 46	199 29	<i>c</i> <sup>2</sup>
<i>g</i>	15.8	+237	+15 36	84 45	195 28	<i>d</i>
<i>g</i> <sup>s</sup>	9.7	+209				<i>d</i> <sup>5</sup>
<i>g</i> <sup>n</sup>	8.8	+225	+15 58	90 50	201 33	
<i>h</i>	+28.6	+420	+40 31	124 28	235 11	<i>e</i>
<i>h</i> <sup>1</sup>	32.9	+399	+40 19	130 11	240 54	<i>e</i> <sup>2</sup>
<i>h</i> <sup>2</sup>	36.0	+413	+42 9	134 35	245 18	<i>e</i> <sup>3</sup>
<i>i</i>	32.2	-778	-34 32	166 31	277 14	<i>f</i>
August 24 3 <sup>h</sup> 10 <sup>m</sup>						
<i>a</i>	-53.3	+490	+13 56	25 36	152 10	
<i>b</i> <sup>s</sup>	44.1	-235				<i>a</i> <sub>1</sub> <i>a</i> <sub>2</sub>
<i>b</i> <sup>n</sup>	43.5	-221	-20 59	65 52	192 26	
<i>c</i> <sup>s</sup>		- 77				<i>b</i>
<i>c</i> <sup>n</sup>	40.4	- 68	-10 19	67 40	194 14	
<i>c</i> <sup>1</sup>	36.9	-110	-11 9	71 59	198 33	
<i>c</i> <sup>2</sup>	35.7	- 94	- 9 47	72 56	199 30	<i>b</i> <sup>2</sup>
<i>d</i>	30.6	+302	+14 1	68 4	194 38	<i>c</i>
<i>d</i> <sup>1</sup>	29.3	+304	+14 35	69 13	195 47	
<i>d</i> <sup>2</sup>	28.8	+299	+14 31	69 51	196 25	
<i>d</i> <sup>3</sup>	25.1	+314	+16 39	72 53	199 27	
<i>d</i> <sup>4</sup>	24.1	+308	+16 39	74 1	200 35	<i>c</i> <sup>1</sup>
<i>d</i> <sup>5</sup>	23.3	+281	+15 26	75 37	202 11	<i>c</i> <sup>2</sup>
<i>e</i>	18.2	+456	+39 50	110 23	236 57	<i>d</i>
<i>e</i> <sup>1</sup>	22.4	+439	+40 3	115 30	242 4	
<i>e</i> <sup>2</sup>	23.5	+438	+40 20	116 49	243 23	
<i>e</i> <sup>3</sup>	26.5	+442	+41 32	120 27	247 1	<i>d</i> <sup>1</sup>
<i>f</i>	25.2	-773	-35 4	153 12	279 46	<i>e</i>
August 26 23 <sup>h</sup> 0 <sup>m</sup>						
<i>a</i> <sub>1</sub>	-58.2	-108	-20 46	41 16	193 28	
<i>a</i> <sub>2</sub>	57.9	- 95	-19 51	41 37	193 49	



Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date	Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1869 August 26—Continued													
$b^n$	-56.4	+ 75"	- 9° 22'	41° 58'	194° 11'		$a^3$	-55.7	+ 54"	-13° 47'	25° 59'	71° 1'	
$b_s$		+ 68					$b_1 s$	45.1	+668	+23 4	6 20	51 22	
$b^1$	54.1	+114	- 5 54	44 41	196 53		$b_2 n$	42.6	+676	+23 39	5 56	50 58	
$b^2$	53.1	+ 47	- 9 10	47 49	200 1		$b^1$	40.8	+668	+24 30	11 17	56 19	
$c^n$	46.6	+437	+14 49	41 2	193 14		$c$	14.1	-465	-23 14	82 50	127 52	
$c_s$		+453					$d$	+12.8	-779	-36 22	122 28	167 30	$b$
$c^1$	41.5	+448	+17 15	47 50	200 3		$d^1$	17.1	-774	-33 44	126 21	171 23	
$c^2$	40.6	+427	+16 32	50 7	202 19		$e$	16.3	+390	+35 25	87 42	132 44	
$d$	+ 1.4	+550	+40 7	87 26	239 38		$e^1$	16.9	+406	+36 48	87 56	132 58	
$d^1$	7.8	+540	+41 55	94 36	246 48		$e^2$	17.6	+376	+35 4	89 24	134 26	
$e$	9.1	-720	-35 4	128 51	281 3	$a$	$f$	25.9	-573	-16 50	122 36	167 38	$c$
$e^1$	11.0	-740	-36 2	132 6	284 19	$a^1$	$f^1$	26.7	-586	-17 25	124 7	169 9	
August 28 0 <sup>h</sup> 34 <sup>m</sup>							$f^2$	27.2	-472	-10 15	119 33	164 35	
$a$	-12.9	-605	-34 13	101 0	282 11		$f^3$	27.7	-632	-20 6	127 49	172 51	
$a^1$	10.8	-618	-34 21	103 27	284 38		$g$	53.8	-156	+14 54	142 17	187 19	$e$
$b$	+ 5.4	+244	+22 40	97 56	279 7		$g^1$	53.8	-172	+13 57	142 40	187 42	$e^1$
$b^1$	8.1	+247	+23 42	100 18	281 29		$g^2$	54.5	-160	+14 48	143 37	188 39	
$c$	38.9	-700	-25 36	163 55	345 6		$g^3$	56.1	-183	+13 42	147 23	192 25	
September 11 23 <sup>h</sup> 3 <sup>m</sup>							September 17 0 <sup>h</sup> 4 <sup>m</sup>						
$a_1$	-46.1	- 69	-15 19	44 25	61 20	$a^1$	$a^1$	-36.7	+417	+13 55	30 59	132 33	
$a_2$	45.2	- 35	-12 57	44 49	61 44	$a^2$	$a$	36.1	+453	+15 58	31 44	133 18	$a$
$a^1$	44.3	- 64	-14 12	46 22	63 17	$a$	$a^2$	34.3	+366	+12 24	37 54	139 28	$a_1^1$
$a^2$	39.0	-109	-14 14	53 18	70 13	$a^3$	$a^3$	32.8	+373	+13 26	39 7	140 41	$a_2^1$
$a^3$	38.4	-100	-13 27	53 45	70 40	$a^3$	$b$	27.8	-550	-37 26	67 53	169 27	$c$
$b$	42.3	-364	-31 38	53 5	70 0	$a^3$	$c$	23.5	-273	-17 17	66 9	167 43	
$c$	40.6	+670	+25 6	13 21	30 16	$a^3$	$d$	11.2	-293	-13 18	77 14	178 48	
$c^1$	40.0	+664	+25 12	15 21	32 16	$a^3$	$e$	+10.0	+ 79	+15 8	85 27	187 1	
$d$	34.4	+574	+23 50	32 3	48 58	$b_2$	$e^1$	10.8	+ 65	+14 37	86 27	188 1	
$d^1$	31.5	+552	+24 7	36 55	53 50	$b_2$	$e^2$	21.2	+123	+21 34	94 24	195 58	$D$
$d^2$	29.4	+568	+25 57	38 9	55 4	$b^1$	$e^3$	24.6	+116	+22 23	97 48	199 22	
$e^1$	32.6	-439	-31 38	65 49	82 44	$b^1$	$f$	46.3	+ 7	+26 46	123 24	224 58	
$e$	31.7	-458	-32 33	67 3	83 58	$b^1$	$f^1$	50.0	- 28	+22 1	129 57	231 31	$e$
$e^2$	31.1	-451	-31 44	67 37	84 32	$d$	$g$	58.7	+ 5	+25 45	146 0	247 34	$f$
$f$	+27.9	-818	-34 22	148 48	165 43	$d$	$g^1$	60.9	+ 21	+26 55	152 11	253 45	$g$
$g^1$	33.3	+267	+34 3	110 54	127 49		September 19 0 <sup>h</sup> 2 <sup>m</sup>						
$g^2$	35.2	+281	+35 36	113 10	130 5	$c^{123}$	$a$	-47.8	+575	+15 16	3 12	132 49	$c^1$
$g$	37.0	+273	+35 42	115 33	132 28	$f^2$	$a_1^1$	47.8	+501	+11 56	10 55	140 32	$c$
$h$	45.8	-543	-10 12	148 29	165 24		$a_2^1$	47.2	+508	+12 36	11 24	141 1	
$h^1$	47.1	-550	-10 29	151 33	168 28		$b$	46.1	+ 14	-11 39	35 6	164 43	$a$
$h^2$	49.0	-523	- 8 27	153 8	170 3		$b^1$	43.3	- 16	-11 55	39 5	168 42	$a^1$
September 13 23 <sup>h</sup> 22 <sup>m</sup>							$c$	45.3	-403	-37 1	41 45	171 22	$b$
$a^1$	-60.0	+ 72	-15 29	16 26	61 28		$d$	15.4	+253	+14 31	55 21	184 58	$d$
$a^2$	60.0	+116	-13 8	15 0	60 2		$d^1$	15.1	+271	+15 34	56 58	186 35	
$a$	59.0	+ 79	-14 23	18 49	63 51		$d^2$	14.8	+260	+15 7	57 35	187 12	$d^1$
							$e$	+30.7	+ 93	+23 13	102 16	231 43	
							$f$	42.7	+ 58	+25 7	116 35	246 12	$e$
							$g$	49.1	+ 56	+26 53	125 35	255 12	$f$

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date	Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1869 September 20 0 <sup>h</sup> 5 <sup>m</sup>													
<i>a</i>	-54.4	+93"	-11° 56'	20° 30'	164° 12'		<i>c</i> <sub>1</sub>	-2.0	+389"	+26° 55'	54° 51'	312° 26'	
<i>a</i> <sup>1</sup>	51.6	+61	-12 6	25 42	169 24		<i>c</i> <sup>1</sup>	0.8	+398	+27 56	55 34	313 9	
<i>b</i>	52.2	-338	-36 59	28 53	172 35		<i>c</i> <sup>2</sup>	0.8	+371	+26 26	56 32	314 7	
<i>c</i>	49.8	+561	+13 2	358 46	142 28		<i>c</i> <sup>3</sup>	+1.9	+346	+26 10	59 42	317 17	<i>c</i> <sup>1</sup>
<i>c</i> <sup>1</sup>	49.0	+588	+14 35	356 37	140 19		<i>c</i> <sup>4</sup>	4.7	+344	+27 17	62 15	319 50	
<i>d</i>	26.4	+351	+14 50	43 8	186 50		<i>c</i> <sup>5</sup>	9.0	+341	+28 55	66 7	323 42	
<i>d</i> <sup>1</sup>	25.9	+360	+15 31	43 14	186 56		<i>d</i>	25.7	-738	-26 41	119 4	16 39	<i>e</i>
<i>e</i>	+32.1	+111	+24 47	102 26	246 8		<i>d</i> <sup>1</sup>	26.2	-761	-28 10	121 55	19 30	<i>e</i> <sup>2</sup>
<i>f</i>	40.1	+102	+26 57	111 45	255 27		<i>e</i> <sup>1</sup>	28.4	-33	+15 28	93 18	350 53	<i>d</i> <sup>3</sup>
September 23 22 <sup>h</sup> 43 <sup>m</sup>							<i>e</i> <sup>n</sup>	28.3	-69	+13 12	94 45	352 20	<i>d</i>
<i>a</i>	+8.1	-619	-25 24	98 47	283 46		<i>e</i> <sup>s</sup>	29.5	-85	+18 13	99 23	356 58	<i>d</i> <sup>4</sup>
<i>b</i>	11.9	+121	+18 1	80 0	264 59	<i>a</i>	<i>e</i> <sup>2</sup>	34.7	-22	+18 13	99 23	356 58	
<i>b</i> <sup>1</sup>	13.6	+125	+18 51	81 21	266 20		September 30 0 <sup>h</sup> 9 <sup>m</sup>						
<i>c</i>	20.7	-813	-34 19	126 13	311 12	<i>b</i>	<i>a</i>	-60.1	-46	-24 14	2 45	286 49	
<i>c</i> <sup>1</sup>	21.5	-833	-34 26	136 36	321 35	<i>b</i> <sup>1</sup>	<i>b</i> <sup>1</sup>	48.6	-318	-33 55	26 29	310 33	
<i>c</i> <sup>2</sup>	26.0	-839	-35 0	137 51	322 50		<i>b</i> <sup>2</sup>	46.0	-369	-35 49	30 42	314 46	
<i>d</i> <sup>n</sup>	54.0	+47	+27 22	129 47	314 46	<i>c</i> <sub>1</sub> <i>c</i> <sub>2</sub>	<i>b</i>	45.1	-355	-34 15	32 4	316 8	<i>a</i>
<i>d</i> <sup>s</sup>	57.2	+28	+28 10	136 15	321 14	<i>c</i> <sup>4</sup>	<i>b</i> <sub>1</sub>	44.2	-380	-35 26	33 31	317 35	<i>a</i> <sup>1</sup>
<i>d</i> <sup>1</sup>	57.5	+28	+27 34	136 56	321 55	<i>c</i> <sup>5</sup>	<i>b</i> <sub>2</sub>	43.6	-382	-35 14	34 19	318 23	
September 24 2 <sup>h</sup> 59 <sup>m</sup>							<i>b</i> <sup>4</sup>	42.3	-791	-35 4	36 12	320 16	
<i>a</i>	-3.5	+223	+17 28	63 6	264 37		<i>e</i> <sup>n</sup>	22.1	+570	+27 24	27 53	311 57	<i>b</i>
<i>b</i>	+12.2	-764	-33 53	110 15	311 45	<i>b</i> <sup>1</sup> <i>b</i> <sup>2</sup>	<i>e</i> <sup>s</sup>	20.3	+554	+27 24	27 53	311 57	
<i>b</i> <sup>1</sup>	19.0	-805	-34 20	121 35	323 6		<i>c</i> <sup>1</sup>	18.2	+511	+26 7	33 30	317 34	
<i>c</i> <sup>1</sup>	43.3	+121	+29 17	111 18	312 49		<i>d</i> <sup>1</sup>	+1.9	+100	+12 42	65 6	349 10	
<i>c</i> <sub>1</sub>	43.3	+102	+28 10	111 31	313 2	<i>c</i> <sub>1</sub> <i>c</i> <sub>2</sub>	<i>d</i> <sup>2</sup>	2.4	+88	+12 15	65 50	349 54	
<i>c</i> <sub>2</sub>	44.8	+74	+27 16	113 48	315 19		<i>d</i> <sup>n</sup>	4.5	+88	+12 58	68 18	352 22	<i>d</i>
<i>c</i> <sup>2</sup>	44.8	+56	+25 56	114 5	315 36	<i>c</i> <sup>2</sup>	<i>d</i> <sup>s</sup>	5.9	+74	+12 58	68 18	352 22	
<i>c</i> <sup>3</sup>	47.9	+79	+28 13	118 7	319 38	<i>c</i> <sup>4</sup>	<i>d</i> <sup>3</sup>	5.5	+111	+14 43	67 45	351 49	<i>d</i> <sup>1</sup> <i>d</i> <sup>2</sup>
<i>c</i> <sup>4</sup>	49.9	+86	+29 15	121 15	322 46	<i>c</i> <sup>5</sup>	<i>d</i> <sup>4</sup>	5.1	+118	+17 50	73 30	357 34	
<i>c</i> <sup>5</sup>	49.9	+58	+27 35	121 26	322 57		<i>d</i> <sup>5</sup>	17.1	+116	+19 29	77 31	1 35	
<i>d</i> <sup>s</sup>	60.9	-227	+13 17	150 20	351 51	<i>e</i>	<i>e</i>	6.8	-614	-25 34	90 44	14 48	<i>e</i>
September 28 2 <sup>h</sup> 51 <sup>m</sup>							<i>e</i> <sup>1</sup>	8.3	-647	-27 5	93 43	17 47	
<i>a</i>	-47.9	-189	-25 3	28 9	285 44	<i>a</i>	<i>e</i> <sup>2</sup>	8.8	-662	-27 54	94 57	19 1	
<i>a</i> <sup>1</sup>	45.5	-249	-27 25	32 9	289 44		<i>f</i>	53.4	-176	+15 11	124 42	48 46	<i>f</i>
<i>b</i> <sup>1</sup>	31.2	-471	-34 6	52 38	310 13	<i>b</i> <sup>1</sup>	October 2 23 <sup>h</sup> 52 <sup>m</sup>						
<i>b</i> <sup>2</sup>	30.0	-477	-33 51	54 5	311 40		<i>a</i>	-58.0	-230	-34 28	6 8	318 6	
<i>b</i>	27.4	-495	-33 41	57 13	314 48	<i>b</i>	<i>a</i> <sup>1</sup>	57.4	-245	-35 2	7 29	319 27	
<i>b</i> <sup>3</sup>	26.7	-529	-35 42	58 46	316 21	<i>b</i> <sub>1</sub>	<i>b</i> <sup>n</sup>	34.5	+700	+27 24	1 23	313 21	
<i>b</i> <sup>4</sup>	25.9	-539	-35 58	59 54	317 29	<i>b</i> <sub>2</sub>	<i>b</i> <sup>s</sup>	33.5	+689	+27 24	1 23	313 21	
<i>c</i> <sup>n</sup>	3.1	+412	+27 34	53 56	311 31	<i>c</i>	<i>c</i> <sup>s</sup>	33.8	+594	+23 8	11 3	323 1	
<i>c</i> <sup>s</sup>	1.8	+396	+27 34	53 56	311 31		<i>c</i> <sup>n</sup>	32.7	+605	+23 8	11 3	323 1	
							<i>c</i> <sup>1</sup> <sup>n</sup>	31.5	+576	+23 1	15 41	327 39	
							<i>c</i> <sup>2</sup> <sup>s</sup>	30.2	+569	+23 1	15 41	327 39	
							<i>d</i> <sup>n</sup>	29.5	+593	+24 44	15 42	327 40	
							<i>d</i> <sup>s</sup>	19.9	+276	+12 40	40 35	352 33	<i>c</i>
							<i>d</i> <sup>1</sup>	16.8	+304	+15 36	41 37	353 35	
							<i>d</i> <sup>2</sup>	16.5	+299	+15 29	41 59	353 57	

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1869 October 2—Continued						
e	-16 <sup>s</sup> .8	-457 <sup>m</sup>	-26° 2'	62° 45'	14° 43'	a
e <sup>1</sup>	10.1	-522	-27 3	70 39	22 37	d
e <sup>2</sup>	8.5	-551	-28 12	73 2	25 0	
e <sup>3</sup>	8.1	-560	-28 36	73 43	25 41	
f	+33.4	-70	+15 3	95 3	47 1	F
f <sup>1</sup>	36.4	-75	+15 48	98 20	50 18	
f <sup>2</sup>	37.2	-86	+15 27	99 26	51 24	

October 6 23<sup>h</sup> 23<sup>m</sup>

a	-57.4	-91	-25 13	4 14	12 3	a?
a <sup>1</sup>	56.6	-100	-25 16	5 50	13 39	
a <sup>2</sup>	54.2	-125	-25 17	10 29	18 18	
b	52.6	+44	-14 47	9 45	17 34	b <sup>3</sup> ?
c <sup>s</sup>	48.9	+568	+12 54	345 49	353 38	
c <sup>n</sup>		+576				
d	48.8	-222	-28 2	19 57	27 46	d
e	28.3	-201	-15 51	42 1	49 50	
e <sup>1</sup>	25.6	-257	-18 18	46 0	53 49	
e <sup>2</sup>	20.9	-282	-17 35	50 47	58 36	e
f <sup>1</sup>	15.4	+314	+16 29	38 31	46 20	
f <sup>2</sup>	13.9	+284	+15 33	40 47	48 36	
f <sup>3</sup>	13.6	+328	+18 0	39 29	47 18	f
f <sup>4</sup>	13.4	+305	+16 52	40 28	48 17	
f	12.8	+252	+14 20	42 45	50 34	
f <sup>5</sup>	9.5	+234	+14 47	46 2	53 51	d
f <sup>6</sup>	7.7	+247	+16 14	47 5	54 54	
g <sup>s</sup>	+53.7	-194	+14 46	119 7	126 56	
g <sup>n</sup>		-176				e
g <sup>1</sup>	59.2	-123	+19 30	128 24	136 13	
g <sup>2</sup>	60.0	-137	+18 19	130 56	138 45	
g <sup>3</sup>	62.7	-116	+20 16	139 8	146 57	f

October 8 23<sup>h</sup> 38<sup>m</sup>

a	-63.3	-51	-27 14	345 19	21 21	a
b <sup>1</sup>	50.1	-60	-19 13	13 46	49 48	
b <sup>2</sup>	49.4	-30	-17 10	14 4	50 6	
b	48.8	-44	-17 37	15 10	51 12	b
b <sup>3</sup>	47.1	-72	-18 18	17 54	53 56	
c	+6.5	-488	-18 7	77 37	113 39	
c <sup>1</sup>	9.9	-511	-18 9	81 18	117 20	c
d <sup>1</sup>	33.8	-88	+13 57	89 41	125 43	
d <sup>s</sup>	35.2	-90				
d <sup>n</sup>	35.9	-72	+14 54	91 18	127 20	c
e <sup>s</sup>	44.1	-58	+19 24	100 21	136 23	
e <sup>n</sup>		-46				
e <sup>1</sup>	45.8	-39	+20 40	102 11	138 13	f
f <sup>1</sup>	52.5	-84	+20 8	112 37	148 39	

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
e <sup>s</sup>	+53 <sup>s</sup> .5	-72 <sup>m</sup>	+21° 26'	113° 51'	149° 53'	d
n		-60				
October 11 23 <sup>h</sup> 22 <sup>m</sup>						
a	-30.4	-191	-17 0	35 23	113 22	a
b <sup>n</sup>	3.0	+198	+15 4	48 30	126 29	
b <sup>s</sup>	1.6	+181				
b <sup>1</sup>	+0.7	+135	+13 23	52 27	130 26	bb <sup>1</sup> b <sub>2</sub> <sup>1</sup>
c <sup>s</sup>	6.7	+207	+20 7	55 32	133 31	
c <sup>n</sup>	7.6	+218				
d <sup>s</sup>	23.4	+109	+21 26	72 37	150 36	d <sup>1</sup>
d <sup>n</sup>	24.3	+125				
e	25.6	-511	-12 29	92 26	170 25	c
e <sup>1</sup>	29.0	-556	-13 58	97 54	175 53	

October 16 23<sup>h</sup> 30<sup>m</sup>

a <sup>s</sup>	-46.9	+589	+15 27	339 57	128 11	a
a <sup>n</sup>	46.1	+598				
b	41.9	+642	+20 14	342 50	131 4	
b <sup>1</sup>	41.8	+633	+19 55	344 4	132 18	a
b <sub>2</sub> <sup>1</sup>	41.3	+638	+20 25	344 21	132 35	
c	31.6	-123	-13 56	27 38	175 52	
c <sup>1</sup>	30.0	-161	-15 20	29 59	178 13	a
d	30.8	+544	+21 2	4 33	152 47	
e	10.2	+204	+12 18	36 40	184 54	
e <sup>1</sup>	6.9	+172	+11 56	40 13	188 27	a
e <sup>2</sup>	4.4	+308	+20 12	38 2	186 16	
f	5.4	-491	-23 47	59 50	208 4	
f <sup>1</sup>	2.6	-515	-24 2	63 0	211 14	a
g	+31.9	+77	+21 43	75 55	224 9	

October 21 23<sup>h</sup> 17<sup>m</sup>

a	-58.3	-54	-23 10	348 30	206 46	b
b	18.9	-550	-34 6	44 48	263 4	
c	+4.6	+259	+20 48	42 4	260 20	
c <sup>1</sup>	7.1	+228	+20 4	44 59	263 15	b
d	40.0	-562	-11 46	100 0	318 16	
d <sup>1</sup>	41.8	-578	-12 14	103 30	321 46	
d <sup>2</sup>	42.5	-578	-12 1	104 30	322 46	b
e <sup>n</sup>	55.9	+52	+27 27	101 51	320 7	
e <sup>s</sup>		+43				
e <sup>1</sup>	56.1	+100	+30 39	102 10	320 26	b <sup>1</sup>
f	56.8	-33	+23 1	104 24	322 40	a

October 25 23<sup>h</sup> 22<sup>m</sup>

a	+15.5	+225	+22 45	48 16	322 44	
b <sup>1</sup>	15.8	+345	+29 44	45 26	319 54	



Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1869 October 25—Continued						
$b^s$	+15.6	+301''	+27° 32'	46° 84'	321° 16'	
$b^n$	16.6	+308				
$b^2$	19.0	+299	+28 21	49 36	324 4	
$b^3$	19.6	+343	+31 9	49 2	323 30	
$c$	16.0	-680	-27 53	77 21	351 49	
$c^1$	18.7	-680	-27 24	79 29	353 57	
November 2 23 <sup>h</sup> 23 <sup>m</sup>						
$a^1$	-44.8	-266	-28 12	359 24	26 9	$a^1$
$a^2$	41.8	-264	-26 44	2 53	29 38	$a_1$
$a$	41.2	-274	-27 4	3 45	30 30	$a_2$
$a^3$	40.0	-313	-28 56	5 37	32 22	
$b$	31.8	-352	-27 43	14 56	41 41	$b$
$c$	24.8	-398	-27 36	22 33	49 18	$c$
$d^1$	5.8	+210	+13 12	23 36	50 21	
$d$	3.7	+217	+14 21	25 4	51 49	
$e$	1.6	-316	-13 44	40 5	66 50	
$f^1$	+56.4	-84	+17 43	90 30	117 15	$d$
$f^s$	59.9	-63	+19 28	96 26	123 11	$d$
$f^2$	61.1	-84	+18 55	99 19	126 4	
$g^s$	60.3	-133	+15 25	98 50	125 35	$e$
$g^n$		-151				
November 3 23 <sup>h</sup> 54 <sup>m</sup>						
$a^1$	-54.5	-191	-28 6	344 13	25 17	$A$
$a^2$	53.4	-188	-27 19	346 7	27 11	
$a^3$	52.6	-223	-29 8	347 25	28 29	
$a_1$	51.5	-197	-27 1	348 50	29 54	
$a_2$	50.8	-204	-27 6	349 53	30 57	$b$
$a^4$	50.6	-220	-28 1	350 17	31 21	
$b$	43.1	-274	-27 52	0 31	41 35	
$c^1$	36.6	-308	-27 5	8 14	49 18	
$c^n$	36.0	-313	-27 31	9 22	50 26	$c$
$c^s$	35.3	-329				
$d^1$	+47.0	-35	+17 30	75 26	116 30	
$d^s$	51.6	-37	+19 11	81 42	122 46	$g$
$d^n$	52.2	-26				
$e^s$	53.0	-116	+15 13	84 37	125 41	$h_1 h_2$
$e^n$		-98				
November 4 0 <sup>h</sup> 7 <sup>m</sup>						
$a^1$	-61.7	-118	-27 31	329 21	24 35	
$a$	60.3	-132	-29 1	332 25	27 39	
$a^2$	59.7	-149	-27 56	333 52	29 6	
$a^3$	57.8	-137	-27 25	337 30	32 44	
$a^4$	57.7	-174	-28 29	337 41	32 55	

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
$b$	-52.6	-202''	-27° 44'	346° 15'	41° 20'	
$c^1$	46.3	-240	-25 42	354 57	50 11	
$c$	45.3	-249	-27 16	356 28	51 42	
$d$	32.4	+414	+14 4	352 26	47 40	
$e$	18.8	-487	-30 51	27 58	83 12	
$f$	+8.9	+72	+10 43	36 41	91 55	
$g^n$	41.4	+35	+19 16	67 20	122 34	$b^2$
$g^s$	42.3	+23				
$h_1$	43.2	-54	+15 2	70 19	125 33	$b$
$h_2$	43.7	-44	+15 44	70 38	125 52	
$i$	52.3	-602	-13 59	113 0	168 14	$c$
November 13 23 <sup>h</sup> 33 <sup>m</sup>						
$a$	-60.2	-75	-22 2	324 21	145 34	$a$
$a^2$	60.2	-86	-22 40	324 25	145 38	
$a$	58.5	-118	-23 52	327 37	148 50	
$b$	53.1	+567	+15 12	306 30	127 43	
$b^1$	52.5	+598	+16 59	303 2	124 15	$b$
$b^2$	50.9	+625	+19 4	303 12	124 25	
$c^n$	42.0	-35	-13 8	348 21	169 34	
$c^s$	41.1	-51				
$d$	21.8	-161	-13 1	8 33	189 46	$c^1 c^2$
$e^1$	+7.6	-529	-24 48	41 58	223 11	
$e^2$	8.2	-531	-24 43	42 33	223 46	
$e$	13.4	-556	-24 33	47 59	229 12	
$f$	22.2	+81	+14 2	38 32	219 45	$d$
$g$	29.3	+177	+21 40	43 8	224 21	
$g^1$	30.2	+151	+20 27	44 24	225 37	
$g^2$	32.3	+176	+22 12	46 6	227 19	
$g^3$	34.8	+151	+21 52	48 50	230 3	$d^3$
$g^4$	36.3	+156	+22 38	50 17	231 30	
$h$	42.1	-639	-22 44	85 24	266 37	
$h^1$	41.9	-667	-20 54	82 58	264 11	
$h^2$	42.7	-650	-21 26	84 58	266 11	$e^1$
						$e$
November 14 23 <sup>h</sup> 54 <sup>m</sup>						
$a$	-64.5	-79	-23 54	313 58	149 25	$a$
$b^n$	52.1	+28	-13 11	334 25	169 52	
$b^s$		+14				
$c^1$	7.0	-456	-25 25	26 17	221 44	
$c^2$	4.4	-465	-25 6	28 43	224 10	$a_1$
$c$	+2.0	-492	-24 36	34 51	230 18	$b?$
$d$	16.1	+264	+22 18	28 46	224 13	
$d^1$	17.1	+246	+21 35	30 0	225 27	
$d^2$	20.1	+237	+22 1	32 46	226 13	
$d^3$	23.8	+220	+22 11	36 20	231 47	$g$
$e$	34.2	-595	-20 43	68 39	264 6	
$e^1$	35.0	-626	-22 23	71 30	266 57	

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date	Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1869 November 19 23 <sup>h</sup> 2 <sup>m</sup>													
$a^n$	-60.8	-139"	-25° 16'	317° 42'	222° 47'		b	-59.8	+ 18"	-11° 28'	305° 16'	47° 24'	
$a_s$		-159					c	17.2	-489	-32 39	355 5	97 13	
$a_1$	59.9	-146	-24 50	319 26	224 31		$d^1$	9.5	-245	-15 42	358 26	100 34	$a^?$
$a^1$	53.0	-186	-24 46	330 25	235 30		$d^2$	7.2	-252	-15 36	0 25	102 33	
$a^2$	51.5	-183	-24 3	332 29	237 34		$d^3$	6.7	-272	-16 40	1 7	103 15	
b	40.4	+589	+22 36	321 41	226 46		$d^4$	5.8	-289	-17 27	2 10	104 18	
c	27.4	-273	-21 27	359 13	264 18		$d^5$	5.0	-268	-16 3	2 27	104 35	
$d^1$	+23.4	-407	-14 7	44 40	309 45	$a$	d	2.7	-286	-14 48	10 22	112 30	
$d^2$	24.4	-463	-17 4	47 26	312 31	$c^1$	$e^n$	+15.4	-309	-13 19	20 5	122 13	b
$d^3$	26.5	-432	-14 40	48 12	313 17		$e^1$	19.2	-295	-12 24	22 40	124 48	
$d^n$	27.9	-479	-17 13	52 28	317 33	d	$e^2$	21.1	-295	-12 0	24 16	126 24	
$d_s$	29.9	-495					$f^1$	26.5	-309	-11 40	29 9	131 17	
$e^1$	44.2	-602	-20 0	75 58	341 3		j	27.6	-351	-13 51	31 13	133 21	
e	44.5	-591	-19 13	75 37	340 42	j	$g^1$	42.7	+144	+17 35	37 10	139 18	
November 22 0 <sup>h</sup> 6 <sup>m</sup>							g	45.0	+141	+18 8	40 32	142 40	
a	-59.4	-102	-21 16	317 24	265 14		h	45.3	-553	-22 4	57 53	160 1	d
b	39.3	+587	+23 27	320 41	268 31		i	54.2	-439	-13 21	64 5	166 13	e
c	20.1	-150	-12 44	358 37	306 27	$a^1$	k	68.2	- 9	+14 4	77 5	179 13	$f^1$
$c^1$	20.5	-169	-13 21	0 16	308 6	$a^2$	l	69.2	+ 44	+17 23	80 3	183 11	$f^2$
$d^1$	12.4	-272	-17 0	8 45	316 35	$a^4$	December 9 0 <sup>h</sup> 18 <sup>m</sup>						
$d^n$	11.3	-286	-17 16	10 8	317 58	a	a	-70.2	- 23	-14 28	274 15	100 45	
$d_s$	10.2	-268					b		- 46				
e	+ 2.1	+328	+20 41	8 25	316 15	b	c	61.5	- 32	-12 55	296 55	123 27	
$e^1$	4.2	+325	+21 7	10 13	318 3	$b^1$	d	57.7	-499	+18 35	283 52	110 24	
$e^2$	8.7	+360	+24 28	13 12	321 2	$b^3$	$d^1$	30.1	-304	-23 37	334 3	160 35	
j	13.3	-432	-19 37	33 29	241 19		e	22.3	-161	-13 34	340 5	166 37	
g	38.5	-673	-27 1	70 29	18 19	c	$e^1$	11.9	-188	-13 21	349 3	175 35	
$g^1$	39.1	-658	-25 53	70 1	17 51		$e^2$	6.4	-190	-12 29	353 33	180 5	
November 24 0 <sup>h</sup> 13 <sup>m</sup>							$f^1$	1.9	+253	+13 43	351 26	177 58	
$a^1$	-47.9	- 5	-11 43	329 52	305 51		$f^2$	+ 5.5	+308	+18 20	356 43	183 15	
$a^2$	46.6	- 44	-13 35	331 51	307 50		$f^3$	7.0	+243	+14 43	358 44	185 16	
$a^3$	43.4	- 81	-14 46	335 48	311 47		$f^4$	7.3	+264	+16 2	358 46	185 18	
$a^4$	39.9	-141	-17 15	340 4	316 3		$f^5$	8.0	+220	+13 33	359 50	186 22	
$a^n$	38.1	-147	-17 6	342 43	318 42		$f^6$	9.3	+227	+14 12	0 50	187 22	
$a_s$	36.6	-155					$f^n$	10.8	+234	+15 39	2 46	189 18	
b	24.8	+468	+21 9	339 55	315 54		g	13.0	+253				
$b^1$	22.1	+457	+21 15	342 41	318 40		h	27.0	-376	-17 21	24 37	211 9	
$b^2$	19.2	+459	+22 12	345 11	321 10				-503	-24 31	39 3	225 35	
$b^3$	18.3	+482	+23 50	345 14	321 13		i	36.6	-524				
c	+20.8	-585	-26 57	43 16	19 15				-560	-25 36	50 36	237 8	
$c^1$	22.3	-551	-24 23	43 12	19 11		$i^1$	44.3	-571	-25 26	54 39	241 11	
d	52.9	-445	-10 21	72 41	48 40	b	$i^2$	46.8	-571	-25 26	54 39	241 11	
$d^1$	55.3	-452	-10 13	77 7	53 6		$i^3$	48.5	-546	-23 33	55 19	241 51	
December 3 0 <sup>h</sup> 15 <sup>m</sup>							k	49.2	-548	-23 31	56 40	243 12	
a	-64.7	-192	-25 10	295 6	37 14				+172	+18 39	42 41	229 13	
$a^1$	63.0	-213	-26 3	298 36	40 44		$k^1$	52.7	+160				
							$l^1$	53.7	+174	+19 20	44 5	230 37	
							$l^n$	67.4	+218	+19 15	43 49	230 21	
							$l_s$	68.2	+202	+23 37	74 8	260 40	
									+188				

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1869 December 27 23 <sup>h</sup> 46 <sup>m</sup>						
a	-67.50	-258"	-19° 52'	260° 34'	338° 59'	
b	59.4	+468	+23 44	266 34	344 59	
b <sup>1</sup>	58.1	+477	+24 13	269 51	348 16	
c	44.9	+509	+26 19	290 17	8 42	
c <sup>1</sup>	44.9	+520	+27 3	289 46	8 11	
d <sup>n</sup>	35.9	-306	-22 51	307 20	25 45	
d <sup>s</sup>	35.0	-315	-22 51	307 20	25 45	
d <sup>1</sup>	29.9	-321	-23 16	312 47	31 12	
d <sup>2</sup>	23.5	-340	-24 10	318 43	37 8	
e <sup>n</sup>	+39.4	-246	-14 42	15 3	93 28	
e <sup>s</sup>	41.2	-262	-14 42	15 3	93 28	
1870 January 19 23 <sup>h</sup> 36 <sup>m</sup>						
a	-46.3	-560	-31 50	255 50	297 21	
a <sup>1</sup>	42.4	-595	-34 54	259 12	300 43	
a <sup>2</sup>	41.8	-586	-31 26	263 22	304 53	
b	35.9	-151	-9 33	282 21	323 52	
c	31.6	-269	-17 0	284 29	326 0	
d <sup>1</sup>	24.1	+343	+17 55	296 22	337 53	
d <sup>2</sup>	19.9	+315	+15 37	300 7	341 38	
d <sup>3</sup>	14.9	+239	+10 24	304 4	345 35	a
d <sup>4</sup>	11.7	+259	+11 14	306 55	348 26	
d	10.9	+262	+11 18	307 44	349 15	
d <sup>5</sup>	7.7	+306	+13 37	310 33	352 4	
d <sup>6</sup>	6.8	+276	+11 43	311 4	352 35	
d <sup>7</sup>	+3.3	+329	+13 54	319 54	1 25	
e	10.0	-339	-25 40	322 6	3 37	
f <sup>s</sup>	32.8	-14	-8 15	343 3	24 34	c
f <sup>n</sup>	33.5	0	-8 0	345 54	27 25	c <sup>1</sup>
f <sup>1</sup>	36.1	0	-8 0	345 54	27 25	c <sup>2</sup> ?
f <sup>2</sup>	39.5	-23	-9 31	349 11	30 42	
f <sup>3</sup>	44.7	-23	-9 46	354 37	36 8	
f <sup>4</sup>	44.9	+9	-7 54	354 53	36 24	c <sup>3</sup>
g <sup>1</sup>	40.4	-395	-32 4	352 58	34 29	E
g	43.5	-383	-31 25	356 40	38 11	
h	46.6	-299	-26 15	358 55	40 26	
i	49.6	-179	-19 4	0 59	42 30	
k	54.8	-202	-21 21	8 36	50 7	
k <sup>1</sup>	54.8	-216	-20 31	8 21	49 52	
January 22 23 <sup>h</sup> 23 <sup>m</sup>						
a	-55.7	+98	+9 7	259 31	343 1	
b	41.7	+412	+25 47	275 25	358 55	
b <sup>1</sup>	37.9	+448	+27 28	279 28	2 58	
b <sup>2</sup>	37.0	+462	+28 15	280 20	3 50	
c	13.5	-86	-8 40	299 45	23 15	a
c <sup>1</sup>	11.2	-70	-8 2	301 50	25 20	
c <sup>2</sup>	2.5	-67	-8 58	309 3	32 33	
1869 December 27 23 <sup>h</sup> 46 <sup>m</sup>						
c <sup>3</sup>	+1.4	-32"	-7° 26'	310° 48'	34° 18'	
d	2.5	+373	+16 19	317 5	40 35	
e	2.1	-414	-30 21	310 33	34 3	
e <sup>1</sup>	2.7	-394	-29 7	310 24	33 54	C
e <sup>2</sup>	5.0	-432	-31 50	312 11	35 41	
e <sup>3</sup>	7.9	-389	-29 28	315 19	38 49	
e <sup>4</sup>	8.9	-396	-30 2	316 10	39 40	
e <sup>5</sup>	9.7	-423	-31 52	316 45	40 15	
f	18.4	-203	-22 13	322 1	45 31	
f <sup>1</sup>	18.4	-229	-22 26	323 41	47 11	d d <sup>1</sup>
g	27.5	+571	+26 38	343 48	67 18	
h	52.7	-314	-28 32	4 56	88 26	
i	66.5	-226	-22 25	33 14	116 44	f
January 26 0 <sup>h</sup> 18 <sup>m</sup>						
a	-59.2	-260	-8 53	243 15	23 25	
b <sup>n</sup>	46.8	+278	+18 17	267 35	47 47	a
b <sup>s</sup>	45.6	+257	+18 17	267 35	47 47	a <sup>1</sup>
b <sup>1</sup>	43.4	+241	+16 1	270 48	50 58	a <sup>2</sup>
b <sup>2</sup>	40.7	+299	+19 26	273 46	53 56	
c <sub>1</sub>	43.7	-560	-30 4	250 54	31 4	B
c <sub>2</sub>	42.6	-575	-31 15	251 22	31 32	
c <sup>1</sup>	41.0	-575	-31 43	253 40	33 50	
c <sup>2</sup>	38.3	-546	-30 40	259 9	39 19	
c <sup>3</sup>	34.4	-550	-31 53	263 41	43 51	
c <sup>4</sup>	34.4	-573	-33 18	262 24	42 34	
d	29.3	+451	+26 26	285 28	65 38	
d <sup>1</sup>	27.7	+467	+27 11	287 5	67 15	
e	+34.4	-128	-17 29	336 53	117 3	c
f	35.2	-218	-23 25	337 22	117 32	d
g	39.0	-25	-11 54	341 50	122 0	f
h	44.1	-98	-16 36	347 9	127 19	e <sup>1</sup> e <sup>2</sup>
h <sup>1</sup>	46.2	-68	-14 57	349 32	129 42	e <sup>3</sup>
January 28 23 <sup>h</sup> 49 <sup>m</sup>						
a <sup>s</sup>	-62.7	+176	+18 28	240 31	48 28	
a <sup>1</sup>	61.6	+162	+16 44	243 21	51 18	
a <sup>2</sup>	59.0	+217	+19 18	247 35	55 32	
b	49.8	-638	-31 29	227 12	35 9	
b <sup>1</sup>	48.8	-609	-30 27	234 11	42 8	
b <sup>2</sup>	46.8	-621	-31 53	237 27	45 24	
b <sup>3</sup>	45.9	-634	-32 56	237 33	45 30	
c	+6.4	-180	-17 17	308 53	116 50	
d	7.7	-275	-23 6	309 4	117 1	
e	12.8	-139	-15 52	314 51	122 48	a
e <sup>1</sup>	16.4	-139	-16 22	317 57	125 54	a <sup>3</sup>
e <sup>2</sup>	17.4	-139	-16 31	318 52	126 49	a <sup>4</sup>
e <sup>3</sup>	19.0	-111	-15 6	320 30	228 27	a <sup>6</sup>



## 1870 January 28—Continued

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
$e^4$	+19.9	-180''	-19° 17'	320° 47'	128° 44'	
$e^5$	21.2	-249	-23 34	321 35	129 32	
$f$	41.1	-53	-11 4	316 45	124 42	
$g^1$	25.6	+538	+22 48	336 5	144 2	
$g$	26.7	+513	+21 1	336 29	144 26	$b$
$h$	35.3	-56	-13 55	335 58	143 55	
$h^1$	37.3	-70	-14 57	337 55	145 52	

January 31 23<sup>h</sup> 48<sup>m</sup>

$a^1$	-31.3	-324	-18 14	269 39	119 42	
$a^s$		-294				
$a_n$	30.7	-281	-16 17	271 11	121 14	
$a^2$	30.2	-317	-18 6	270 54	120 57	
$a^3$	29.0	-290	-16 49	272 41	122 44	
$a^4$	27.9	-281	-16 34	273 59	124 2	
$a^5$	27.1	-317	-18 47	273 48	123 51	
$a^6$	24.7	-251	-15 33	277 33	127 36	
$a^7$	24.7	-301	-18 25	276 26	126 29	
$b^1$	18.5	+390	+20 26	291 26	141 29	
$b^2$	17.4	+399	+20 45	292 34	142 37	
$b$	15.0	+401	+20 22	294 43	144 46	
$c$	11.1	+333	+15 21	297 21	147 24	
$d$	+5.0	+439	+18 55	312 32	162 35	
$d^1$	9.2	+462	+19 38	316 36	166 39	
$e$	44.0	+608	+24 48	359 16	209 19	
$f$	45.6	-41	-15 4	344 2	194 5	

February 7 0<sup>h</sup> 8<sup>m</sup>

$a$	-54.0	-403	-13 55	230 46	179 15	
$a^1$	53.1	-376	-12 51	233 47	182 16	
$b_1$	47.9	-585	-25 46	226 50	175 19	
$b_2$	47.4	-589	-26 12	227 20	175 49	
$c$	18.0	+389	+20 22	285 57	234 26	
$d$	6.5	-157	-13 57	287 25	235 54	
$e_1$	+4.6	-357	-28 12	293 28	241 57	$d^1$
$e_2$	6.1	-362	-28 51	294 46	243 15	$d$
$e_3$	7.3	-353	-28 35	296 2	244 31	$d^2$
$e^1$	16.3	-367	-31 32	304 31	253 0	
$e^2$	20.4	-364	-32 15	308 41	257 10	
$f$	4.0	+25	-6 1	299 2	247 31	
$f^1$	6.5	+60	-4 33	301 36	250 5	
$f^2$	9.1	+30	-6 47	303 17	251 46	
$f^3$	11.5	+58	-5 41	305 42	254 11	
$f^4$	12.8	+2	-9 8	306 2	254 31	
$g$	17.5	-261	-25 19	306 53	255 22	
$h$	17.0	-81	-14 42	208 34	257 3	
$h^1$	19.5	-98	-16 10	310 35	259 4	

$h^2$	+20.3	-84''	-15° 31'	311° 28'	259° 57'	
$i$	6.7	+531	+23 30	310 12	258 41	$b$
$i^1$	8.2	+534	+23 21	311 40	260 9	
$k^s$		-298				
$k_n$	53.2	-276	-33 2	350 0	298 29	$g$
$k^1$	54.6	-294	-33 36	352 42	301 11	
$k^2$	55.5	-271	-32 14	353 43	302 12	$g^4$
$k^3_s$		-289				
$k_n$	58.0	-277	-33 6	359 29	307 58	$g^7$

February 10 0<sup>h</sup> 10<sup>m</sup>

$a$	-44.5	-230	-7 13	247 30	238 6	
$a^1$	43.5	-200	-5 56	249 27	240 3	
$a^2$	39.8	-232	-8 51	252 32	243 8	
$a^3$	39.4	-191	-6 44	254 1	244 37	
$a^4$	35.4	-172	-6 55	258 28	249 4	
$a^5$	34.3	-142	-5 37	260 16	250 52	
$a^6$	31.4	-126	-5 35	263 20	253 56	
$a^7$	31.4	-107	-4 32	263 45	254 21	
$b^1$	35.0	+348	+23 0	266 32	257 8	
$b$	34.5	+353	+23 8	267 8	257 44	
$c$	30.7	-447	-23 33	254 25	245 1	
$d^1$	28.4	-540	-29 38	252 29	243 5	
$d$	27.7	-528	-29 9	253 46	244 22	
$d^2$	26.8	-523	-29 10	254 59	245 35	
$e^1$	27.8	-346	-18 45	260 53	251 29	
$e^2$	27.2	-358	-19 36	261 4	251 40	
$e$	24.7	-362	-20 35	263 21	253 57	
$f$	9.4	-79	-8 52	283 16	273 52	
$f^1$	7.1	-66	-8 42	285 22	275 54	
$f^2$	7.0	-82	-9 38	285 10	275 46	
$f^3$	4.9	-51	-8 24	287 26	278 2	
$f^4$	3.3	-70	-9 2	287 57	278 33	
$f^5$	2.7	-56	-8 39	288 49	279 25	
$g^s$	+24.0	-376				
$g_n$	25.6	-360	-33 58	309 47	300 23	
$g^1$	27.0	-374	-34 52	312 12	302 48	
$g^2$	27.5	-353	-33 39	312 51	303 27	
$g^3$	28.5	-358	-34 11	313 57	304 33	
$g^4$	30.6	-335	-33 10	316 20	306 56	
$g^5$	30.6	-401	-37 26	316 14	306 50	
$g^6$	32.2	-278	-29 57	318 20	308 56	
$g^7_s$		-348				
$g_n$	35.6	-337	-34 21	320 13	310 49	
$h_1$	51.5	+493	+12 55	356 9	346 45	
$h_2$	52.5	+493	+12 53	358 2	348 38	
$h^1$	53.8	+511	+14 7	2 41	353 17	
$h^2_n$	54.9	+526	+14 33	8 5	359 41	
$h^3_s$	56.0	+503				
$i$	61.2	-64	-21 9	358 53	349 29	
$i^1$	63.9	-19	-18 26	5 22	355 58	

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date	Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1870 February 23 23 <sup>h</sup> 14 <sup>m</sup>							$a^3$	-47 <sup>s</sup> .5	+ 23''	+12° 36'	225° 21'	193° 33'	
$a$	-64 <sup>s</sup> .3	- 85''	+13° 12'	203° 19'	15° 48'		$a^4$	46.2	+ 14	+11 30	226 44	194 56	
$b^1$	55.3	+ 62	+16 13	226 35	39 4		$a$	45.8	+ 25	+11 55	227 25	195 37	
$b^2$	54.0	+ 99	+17 45	229 2	41 31		$b$	45.4	-471	-13 46	209 17	177 29	
$b^3$	52.5	+136	+18 32	231 31	44 0		$c$	39.3	-404	-13 22	220 28	188 40	
$b$	51.6	+115	+17 34	232 42	45 11		$d$	34.0	+220	+17 44	243 44	211 56	$c$
$c$	47.0	-553	-18 5	233 2	45 31		$d^1$	33.0	+200	+16 8	244 20	212 32	$c^1$
$c^1$	42.9	-551	-19 19	236 35	49 4		$d^2$	32.2	+239	+18 2	245 52	214 4	
$d$	32.1	-540	-25 34	233 18	45 47		$d^3$	31.5	+271	+19 38	247 10	215 22	
$e$	+23.0	- 69	-17 34	297 35	110 4	$d$	$e$	33.8	+100	+10 49	241 35	209 47	$b$
$f$	25.5	+251	- 0 14	305 53	118 22		$e^1$	31.5	+109	+10 22	243 57	212 9	
$f^1$	30.3	+276	- 0 0	311 0	123 29		$f$	29.4	-423	-16 33	138 59	207 11	
$g$	34.5	+ 64	-12 58	310 48	123 17		$g$	25.7	+274	+17 22	252 42	220 54	$d$
$g^1$	37.4	+ 71	-13 16	313 58	126 27		$g^1$	24.8	+350	+21 34	254 58	223 10	
$h^1$	60.0	+ 74	-17 4	346 1	158 30	$g^1$	$g^2$	24.3	+298	+18 15	254 24	222 36	
$h$	60.8	+ 67	-17 31	347 45	160 14	$g$	$g^3$	24.3	+269	+18 28	253 39	221 51	
$h^2$	62.5	+ 32	-19 35	351 58	164 27		$h$	13.5	-264	-16 52	249 46	217 58	$f$
February 26 23 <sup>h</sup> 40 <sup>m</sup>							$i^1$	6.8	- 60	- 8 7	261 1	229 13	$g^1$
$a$	-42.3	+190	+18 26	242 15	97 6		$i$	5.7	- 39	- 7 22	262 23	230 35	
$a^1$	41.3	+167	+16 41	242 58	97 49		$i^2$	4.3	+ 23	- 4 31	264 59	233 11	
$b$	35.7	-278	- 9 44	238 3	92 54		$i^3$	4.4	- 99	-11 3	261 59	230 11	$g^4$
$b^1$	33.8	-260	- 9 32	240 28	95 19		$i^4$	0.4	+ 25	- 5 46	268 11	236 23	
$c_1$	30.8	+276	+18 52	255 24	110 15		$i^5$	+ 0.1	- 34	- 9 7	267 13	235 25	
$c_2$	30.3	+286	+19 16	256 3	110 54		$i^6$	1.5	- 5	- 8 1	268 57	237 9	$g$
$c^1$	27.9	+330	+21 0	259 4	113 55		$i^7$	4.7	- 85	-13 35	269 46	237 58	
$c^2$	27.4	+299	+18 55	259 2	113 53		$k$	4.8	+383	+15 44	273 5	241 17	$e$
$d$	16.4	-279	-16 57	255 36	110 27		$k^1$	2.3	+404	+16 4	275 43	243 55	
$e$	12.0	-366	-23 20	256 46	111 37		$k^2$	1.8	+414	+16 30	276 23	244 35	$e^2$
$f$	+ 2.3	-136	-15 24	275 6	129 57		$k^3$	1.3	+396	+15 15	276 16	244 28	
$g^1$	30.3	- 5	-16 18	302 31	157 22		$l$	20.6	- 97	-19 52	283 40	251 52	$h$
$g^2$	31.7	+ 9	-15 53	304 10	159 1		$l^1$	21.5	-108	-20 19	287 50	256 2	
$g$	34.8	- 18	-18 13	306 53	161 44		$l^2$	25.2	- 87	-20 19	291 33	259 45	
$g^3$	37.3	- 5	-18 5	309 40	164 31		$l^3$	28.3	- 51	-19 15	292 45	260 57	$h^2$
$g^4$	40.3	- 55	-21 42	312 23	167 14		$l^4$	29.6	- 53	-19 45	293 28	261 40	
$h^1$	39.5	+117	-11 42	314 2	168 53		$l^5$	30.4	- 60	-20 24	294 7	262 19	
$h$	47.2	+134	-12 26	323 27	178 18	$b$	$l^6$	31.0	- 58	-20 28	294 7	262 19	
$h^2$	47.6	+167	-10 37	324 36	179 27		$m$	61.8	-131	-31 52	342 51	311 3	
$h^3$	48.6	+125	-13 13	325 6	179 57		$n$	62.4	-205	-36 7	349 32	317 44	$l$
$h^4$	49.4	+155	-11 38	326 45	181 36		March 9 0 <sup>h</sup> 17 <sup>m</sup>						
$h^5$	53.2	+134	-13 32	331 52	186 43		$a$	-62.6	-216	+ 9 28	184 26	194 11	
$h^6$	53.9	+129	-13 55	332 53	187 44	$c^?$	$b$	59.9	-140	+11 2	198 13	207 48	
$h^7$	55.8	+187	-10 49	337 10	192 1		$c$	59.2	- 28	+16 34	203 4	212 39	
$h^8$	56.4	+122	-14 41	336 59	191 50		$c^1$	59.2	- 51	+15 18	202 32	212 7	
$i$	49.5	+400	+ 2 37	334 23	189 14		$d$	54.8	+ 23	+16 50	212 16	221 51	
March 6 1 <sup>h</sup> 31 <sup>m</sup>							$e$	42.4	+ 86	+14 11	229 37	239 12	
$a^1$	-51.2	- 39	+10 56	219 21	187 33		$e^1$	38.4	+124	+14 31	234 39	244 14	
$a^2$	49.3	- 2	+12 5	222 34	190 46		$e^2$	37.7	+161	+16 18	236 5	245 40	
							$f$	41.9	-513	-16 59	208 5	217 40	
							$g^1$	40.6	-318	- 7 53	219 49	229 24	

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date	Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1870 March 9—Continued							$e^1$	+21 <sup>s</sup> .4	— 46''	—17° 11'	276° 58'	35° 644'	
$g^2$	—40 <sup>s</sup> .6	—341''	— 9° 3'	218° 51'	228° 26'		$e^2$	25.4	— 25	—17 23	281 9	0 55	
$g^3$	38.0	—285	— 7 22	223 52	233 27		$e$	27.5	— 46	—19 9	282 28	2 14	
$g^4$	38.0	—374	—11 54	220 13	229 48		$f^1$	30.6	+519	+11 31	301 35	21 21	
$g^5$	36.4	—260	— 6 48	226 26	236 1		$f^s$	32.8	+502				
$g^6$	35.6	—253	— 6 46	227 26	237 1		$f_n$	34.0	+516	+10 6	304 5	23 51	$c$
$g$	35.0	—276	— 8 13	227 12	236 47		$g$	42.4	+642	+16 19	324 53	44 39	$d$
$g^7$	33.9	—278	— 8 47	228 13	237 48		$h^s$	59.0	— 75	—28 59	325 59	45 45	$e$
$g^8$	33.3	—308	—10 35	227 42	237 17		$h_n$	— 51					
$h_n$	16.2	—362	—20 8	242 35	252 10	$a$	$h^1$	60.7	— 9	—26 1	330 24	50 10	$e^5$
$h_s$	14.4	—333					March 18 23 <sup>h</sup> 59 <sup>m</sup>						
$h^1$	8.9	—319	—21 7	249 0	258 35		$a^1$	—59.5	—172	+10 47	188 21	324 4	
$h^2$	5.8	—293	—20 54	252 29	262 4	$a^1$	$a^2$	57.4	— 42	+16 19	197 8	332 51	
$h^3$	4.0	—281	—20 56	254 21	263 56		$a^3$	57.4	—108	+12 44	195 17	331 0	
$i^1$	16.3	—207	—11 16	250 13	259 48		$a$	56.1	—101	+11 21	197 20	333 3	
$i$	15.6	—230	—13 43	246 6	255 41				—138				
$i^2$	13.6	—193	—12 32	248 52	258 27		$a^4$	53.6	+ 0	+16 51	204 48	340 31	
$k^1$	+43.2	+598	+13 54	326 47	336 22	$B$	$a^5$	51.4	+ 0	+15 7	207 54	343 37	
$k^2$	44.6	+600	+13 49	329 22	338 57		$a^6$	50.7	— 48	+11 12	207 17	343 0	
$k$	45.5	+613	+14 35	332 33	342 8		$a^7$	50.7	—101	+ 9 20	206 17	342 0	
$k^3$	46.0	+596	+13 20	331 48	341 23 <sup>b</sup>		$a^8$	50.0	+ 30	+16 3	210 25	346 8	
$k^4$	47.2	+596	+13 12	334 25	344 0		$a^9$	49.7	— 32	+12 16	209 18	345 1	
$k^5$	48.1	+578	+11 52	334 30	344 5		$b$	30.1	—765	—34 9	189 55	325 38	
$l^1$	44.5	—212	—33 54	305 21	314 56		$c_n$	17.1	+212	+10 32	247 44	27 27	
$l$	48.1	—244	—36 57	311 5	320 40	$c$	$c_s$	16.0	+200				
$m$	47.1	+ 71	—17 58	311 38	321 13		$d^1$	1.0	+412	+16 2	265 57	41 40	
$n$	61.9	+105	—18 31	339 57	349 32	$d$	$d$	0.1	+421	+16 22	266 37	42 20	$a$
$n^1$	63.2	+ 99	—18 44	344 49	354 24	$e^1$	$d^2$	+ 1.4	+430	+16 11	268 26	44 9	
March 14 0 <sup>h</sup> 19 <sup>m</sup>							$d^3$	5.8	+487	+17 53	273 56	49 39	
$a$	—45.6	—668	—20 35	177 45	257 31		$d^4$	6.6	+405	+12 28	275 52	51 35	
$a^1$	44.7	—648	—20 36	184 36	264 22		$d^5$	7.1	+466	+16 8	274 20	50 3	
$b^1$	22.2	+198	+12 10	246 34	326 20		$d^6$	7.1	+426	+13 44	273 2	48 45	$A$
$b^2$	21.1	+228	+13 24	248 12	327 58		$d^7$	8.1	+424	+13 18	273 48	49 31	
$b^3$	19.4	+207	+11 31	249 10	328 56		$d^8$	8.8	+444	+14 13	275 2	50 45	
$b^4$	15.8	+306	+15 25	254 26	334 12	$a^2$	$d^9$	9.7	+452	+14 21	276 3	51 46	
		+297					$e^1$	7.8	—152	—18 8	258 31	34 14	
$b^5$	13.2	+363	+17 55	258 12	337 58		$e^2$	8.8	—150	—18 24	259 25	35 8	
$b^6$	13.2	+285	+13 25	256 16	336 2		$e^3$	11.7	—152	—19 35	261 49	37 32	
$b^7$	10.8	+377	+17 47	260 32	340 18	$a^4$	$e^4$	15.0	—186	—22 43	263 56	39 39	
$b^8$	10.8	+246	+10 16	257 15	337 1		$e_1$	24.1	—255	—30 6	270 59	46 42	
$b^9$	9.6	+290	+12 16	259 22	339 8		$e$	25.0	—248	—29 26	272 15	47 58	$d$
$b$	6.4	+344	+14 8	263 20	343 8	$a^5$			—228				
$b^{10}$	6.4	+260	+ 9 22	261 11	340 57		$e^5$	26.9	—175	—26 29	275 26	51 9	
$b^{11}$	4.7	+377	+15 22	265 39	345 25	$a^8$	$f$	49.6	+104	—17 47	306 52	82 35	
$b^{12}$	4.7	+304	+11 10	263 43	343 29	$a^6$	$f^1$	50.6	+ 81	—19 20	307 55	83 38	
$b^{13}$	3.4	+335	+12 27	265 33	345 19	$a^9$	$g$	63.7	— 84	—30 47	340 46	116 29	$g_1 g_2$
$b^{14}$	+ 1.3	+295	+ 8 27	268 19	348 5								
$c$	— 1.3	—515	—35 4	242 59	322 45	$b$							
$d$	+10.8	—124	—17 46	265 51	345 37								



Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1870 March 24 0 <sup>h</sup> 4 <sup>m</sup>						
a	-61.2	-104"	+16° 13'	180° 28'	40° 26'	
a <sup>1</sup>	59.2	-69	+16 42	186 38	46 36	
a <sup>2</sup>	56.5	-51	+15 56	192 41	52 39	
a <sup>3</sup>	55.5	-71	+14 18	193 47	53 45	
b <sup>1</sup>	46.7	-508	-12 2	185 53	45 51	
b	46.2	-499	-11 54	187 24	47 22	
c	39.2	+46	+12 10	217 34	77 32	
c <sup>1</sup>	33.8	+85	+11 46	223 48	83 46	
c <sup>2</sup>	30.8	+83	+10 18	226 34	86 32	
d <sup>n</sup>	33.9	-688	-27 50	189 20	49 18	
s	32.8					
e <sup>1</sup>	26.3	+252	+17 43	234 37	94 35	
e	22.5	+293	+18 21	239 1	98 59	
e <sup>2</sup>	20.9	+321	+18 23	240 42	100 40	
f	7.3	-67	-7 30	242 21	102 19	
f <sup>1</sup>	4.5	-75	-9 3	244 25	104 23	
f <sup>2</sup>	1.5	-83	-10 38	246 34	106 32	
f <sup>3</sup>	0.7	-48	-9 7	248 11	108 9	
f <sup>4</sup>	+2.2	-57	-10 42	250 15	110 13	
f <sup>5</sup>	2.6	-75	-11 49	250 6	110 4	
f <sup>6</sup>	3.6	-108	-13 57	250 1	109 59	
f <sup>7</sup>	7.3	-136	-16 54	152 23	112 21	
g <sub>1</sub>	20.7	-280	-30 13	260 43	120 41	
g <sub>2</sub>	21.8	-273	-30 16	262 1	121 59	
g <sup>1</sup>	22.5	-293	-31 44	262 15	122 13	
h <sup>n</sup>	44.0	+30	-20 59	292 54	152 52	
s	45.6					
h <sup>1</sup>	50.2	+12	-23 36	300 11	160 9	D
h <sup>2</sup>	50.6	+25	-22 58	300 58	160 56	
h <sup>3</sup>	53.5	+53	-22 6	306 3	166 1	
h <sup>4</sup>	55.4	+87	-20 36	309 59	169 57	
h <sup>5</sup>	59.3	+69	-22 23	317 59	177 57	
i <sup>n</sup>	46.2	+563	+8 6	316 29	176 27	a
s	48.5	+530				
i <sup>2</sup>	47.3	+534	+6 32	315 21	175 19	a <sup>1</sup>
s	48.5	+512				
k	53.8	+189	-14 23	309 26	169 24	C
k <sup>1</sup>	54.5	+264	-10 12	313 9	173 7	
k <sup>2</sup>	55.4	+205	-13 46	312 42	172 40	
k <sup>3</sup>	56.9	+241	-11 58	317 0	176 58	
April 3 0 <sup>h</sup> 11 <sup>m</sup>						
a	-57.3	-189	+9 57	176 38	177 1	
a <sup>1</sup>	57.3	-249	+6 58	173 46	174 9	
b <sup>1</sup>	53.1	-71	+13 39	187 56	188 19	
b	52.3	-32	+15 20	190 4	190 27	
c <sup>1</sup>	52.3	-455	-5 42	170 6	170 29	
c <sup>2</sup>	50.5	-476	-7 43	171 58	172 21	
c	49.6	-476	-8 15	173 39	174 2	
April 9 23 <sup>b</sup> 12 <sup>m</sup>						
a <sup>1</sup>	-43.6	-585	-16 36	168 35	252 35	
a <sup>2</sup>	40.2	-569	-17 43	175 6	259 6	
a <sup>3</sup>	39.2	-598	-19 38	174 1	258 1	
a	37.2	-640	-22 42	172 50	256 50	
a <sup>4</sup>	36.3	-602	-21 20	177 25	261 25	
a <sup>5</sup>	35.0	-625	-23 10	177 8	261 8	
a <sup>6</sup>	33.5	-580	-21 39	182 23	266 23	
a <sup>7</sup>	30.9	-591	-23 33	184 31	268 31	
b	34.5	+80	+12 52	207 25	291 25	
b <sup>1</sup>	33.7	+84	+12 42	208 20	292 20	
c <sub>1</sub>	31.0	-779	-32 53	164 17	248 17	
c <sup>n</sup>	30.3	-781	-34 1	165 20	249 20	
s	29.0	-790				
c <sup>1</sup>	24.6	-777	-36 37	173 43	257 43	

1870 April 9—Continued

Letter	<i>da</i>	<i>dδ</i>	<i>b</i>	<i>L</i>	<i>L'</i>	Letter on next date
<i>c</i> <sup>2</sup>	-23°3	-781''	-37° 34'	174° 43'	258° 43'	
<i>d</i> <sup>n</sup>	26.3	+139	+11 43	216 6	300 6	
<i>e</i> <sup>1</sup>	7.2	+254	+10 38	235 14	319 14	
<i>e</i> <sup>2</sup>	2.9	+414	+18 0	243 17	327 17	
<i>e</i> <sup>3</sup>	1.9	+423	+18 5	244 26	328 26	<i>a</i> <sup>1</sup>
<i>e</i> <sup>4</sup>	+ 1.4	+346	+12 20	244 42	328 42	
<i>e</i> <sup>5</sup>	1.4	+302	+ 9 52	243 25	327 25	<i>a</i> <sub>1</sub>
<i>e</i> <sup>6</sup>	2.1	+439	+17 25	248 9	332 9	<i>a</i> <sup>2</sup>
<i>e</i> <sup>7</sup>	2.9	+396	+14 36	247 24	331 24	
<i>e</i> <sup>n</sup>	2.9	+328	+10 6	245 0	339 0	<i>a</i> <sub>2</sub>
<i>e</i> <sup>8</sup>	8.2	+394	+12 22	251 45	335 45	
<i>e</i> <sup>9</sup>	13.7	+419	+11 43	257 7	341 7	
<i>e</i> <sup>10</sup>	21.7	+491	+12 54	266 47	350 47	
<i>f</i>	- 5.2	-337	-21 46	220 0	304 0	<i>b</i>
<i>f</i> <sup>1</sup>	4.4	-313	-20 50	221 32	305 32	
<i>f</i> <sup>2</sup>	+ 1.5	-298	-22 29	226 53	310 53	
<i>f</i> <sup>3</sup>	3.3	-279	-22 11	228 59	312 59	
<i>g</i> <sup>1</sup>	13.4	- 41	-13 15	243 54	327 54	
<i>g</i> <sup>2</sup>	16.2	- 9	-12 36	247 7	331 7	
<i>g</i>	21.1	+ 14	-13 11	251 55	335 55	<i>c</i>
<i>h</i>	29.2	- 48	-19 34	257 57	341 57	<i>f</i>
<i>i</i> <sup>n</sup>	37.0	+ 16	-18 57	267 47	351 47	<i>g</i>
<i>k</i>	38.0					
<i>l</i>	43.0	+ 14	-20 56	274 0	358 0	
	50.2	+ 28	-22 27	283 53	7 53	

April 13 23<sup>h</sup> 29<sup>m</sup>

<i>a</i> <sup>1</sup>	-48.2	+ 46	+17 42	187 52	328 10	
<i>a</i> <sub>1</sub>	47.1	- 82	+10 11	186 0	326 18	
<i>a</i> <sub>2</sub>	46.3	- 71	+10 21	187 20	327 38	
<i>a</i> <sub>3</sub>	45.8	- 37	+11 33	188 39	328 57	
<i>a</i> <sup>2</sup>	45.2	+ 21	+14 48	190 58	331 16	
<i>a</i> <sup>3</sup>	45.2	0	+13 1	190 11	330 29	
<i>a</i> <sup>4</sup>	45.2	- 16	+12 6	189 45	330 3	
<i>b</i>	40.0	-641	-21 23	164 40	304 58	
<i>c</i>	28.6	-387	-14 6	194 8	334 26	
<i>d</i>	20.3	-251	-10 36	206 32	346 50	
<i>e</i>	19.4	+302	+18 53	222 28	2 46	
<i>f</i>	8.1	-414	-20 11	202 19	342 37	
<i>g</i> <sup>n</sup>	12.0	-327	-18 47	211 1	351 19	
<i>h</i>	10.9	-340				
<i>h</i> <sup>1</sup>	9.8	+213	+ 9 47	228 5	8 23	
<i>h</i> <sup>2</sup>	7.0	+247	+10 31	231 17	11 35	
<i>i</i>	5.8	+270	+11 20	232 50	13 8	
	+33.1	+530	+11 43	275 53	56 11	

Letter	<i>da</i>	<i>dδ</i>	<i>b</i>	<i>L</i>	<i>L'</i>	Letter on next date
<i>k</i> <sup>1</sup>	+37°7	+632''	+16° 31'	288° 2'	68° 20'	
<i>k</i>	39.1	+621				
<i>k</i> <sup>2</sup>	39.8	+610	+14 57	289 11	69 29	<i>a</i>
<i>l</i>	43.0	+581	+11 49	291 43	72 1	
	46.9	-106				
		- 95	-29 2	273 30	53 48	<i>c</i>

April 23 2<sup>h</sup> 48<sup>m</sup>

<i>a</i>	-62.0	-128	+15 4	149 47	72 22	
<i>b</i> <sup>1</sup>	41.9	+ 14	+12 51	184 37	107 12	
<i>b</i>	40.6	+ 44	+13 58	186 38	109 13	
<i>c</i>	37.6	-766	-29 15	139 49	62 24	
<i>d</i>	31.9	-398	-13 10	181 4	103 39	
<i>d</i> <sup>1</sup>	26.6	-362	-13 31	187 29	110 4	
<i>e</i> <sup>n</sup>	11.1	-398				
<i>e</i> <sup>s</sup>	10.3	-416	-22 36	199 28	122 3	<i>b</i>
<i>e</i> <sup>1</sup>	8.6	-385	-22 14	202 4	124 39	<i>b</i> <sup>1</sup>
<i>e</i> <sup>2</sup>	4.7	-398	-24 36	204 55	127 30	
<i>e</i> <sup>3</sup>	3.1	-371	-23 40	207 6	129 41	
<i>f</i>	+11.6	-157	-17 33	225 39	148 14	<i>d</i>
<i>f</i> <sup>1</sup>	11.9	-142	-16 51	226 19	148 54	
<i>g</i>	18.4	+367	+ 8 43	245 12	267 47	
<i>h</i> <sup>1</sup>	22.6	+504	+15 6	254 1	176 36	<i>e</i> <sup>1</sup>
<i>h</i> <sup>2</sup>	25.9	+480	+12 33	256 4	178 39	<i>e</i> <sup>4</sup>
<i>h</i>	27.0	+451	+10 30	255 55	178 30	<i>e</i> <sup>5</sup>
<i>i</i> <sup>1</sup>	23.7	-132	-20 41	236 52	159 27	<i>f</i>
<i>i</i> <sup>2</sup>	30.5	-105	-21 37	243 52	166 27	
<i>i</i> <sup>3</sup>	32.3	-192	-27 21	244 5	166 40	<i>g</i>
<i>i</i> <sup>4</sup>	33.3	-121	-23 34	246 25	169 0	
<i>i</i> <sup>n</sup>	35.1	- 74				
<i>i</i> <sup>s</sup>		- 86	-21 51	249 1	171 36	<i>i</i>
<i>k</i> <sup>n</sup>	34.2	+256				
<i>k</i> <sup>s</sup>		+245	- 3 9	255 57	178 32	<i>h</i>
<i>l</i> <sup>1</sup>	46.9	- 90	-26 32	262 50	185 25	
<i>l</i>	47.7	- 41	-23 54	264 27	187 2	<i>k</i> <sup>2</sup>
<i>l</i> <sup>2</sup>	49.9	- 67	-26 10	267 18	189 53	<i>k</i>

April 26 23<sup>h</sup> 47<sup>m</sup>

<i>a</i> <sup>1</sup>	-48.9	- 28	+13 39	172 49	135 45	
<i>a</i>	46.1	+ 8	+14 20	176 57	139 53	
<i>b</i> <sup>n</sup>	38.3	-604	-22 14	158 48	121 14	
<i>b</i> <sup>s</sup>	37.2	-630				
<i>b</i> <sup>1</sup>	36.3	-604	-22 13	161 43	124 39	
<i>b</i> <sup>2</sup>	33.3	-608	-23 50	164 59	127 55	
<i>b</i> <sup>3</sup>	29.7	-595	-24 48	169 58	132 54	
<i>c</i>	27.3	-201	- 4 45	189 49	152 45	
<i>c</i> <sup>1</sup>	23.7	-187	- 5 26	193 23	156 19	<i>b</i>
<i>d</i>	23.7	-420	-17 53	185 8	148 4	
<i>e</i>	17.0	+222	+14 9	209 31	172 27	<i>a</i>
<i>e</i> <sup>1</sup>	13.2	+259	+14 46	213 32	176 28	

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date	Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
1870 April 26—Continued													
$e^2$	-12.7	+210''	+11° 47'	212° 46'	175° 42'		$a^2$	-55.2	-69''	+13° 14'	154° 27'	245° 29'	
$e^3$	11.3	+178	+9 29	213 4	176 0		$b^{\text{n}}$	46.9	-525	-15 8	145 54	236 56	
$e^4$	10.2	+235	+12 14	215 25	178 21		$b^{\text{s}}$	45.6	-538				
$e^5$	10.2	+222	+11 30	215 5	178 1		$b^{\text{r}}$	43.9	-453	-11 59	154 31	245 33	
$f$	11.6	-379	-20 35	197 9	160 5		$b^2$	28.1	-481	-15 50	159 50	250 52	
$f^{\text{r}}$	11.1	-331	-18 8	199 15	162 11		$b^3$	33.0	-498	-18 49	164 28	255 30	
$g^{\text{r}}$	4.1	-441	-27 10	201 11	164 7		$c$	38.6	-740	-30 13	133 38	224 40	
$g$	1.5	-434	-27 52	203 44	166 40	$g^{\text{r}}$	$c^{\text{r}}$	37.0	-758	-31 24	133 24	224 26	
$h$	4.4						$d^{\text{n}}$	18.1	-400				
	3.7	0	-2 33	214 31	177 27	$d$	$d^{\text{s}}$	16.7	-411	-19 42	183 3	274 5	
$i^{\text{s}}$	+1.1	-326					$d^{\text{r}}$	14.6	-417	-21 24	185 3	276 5	
$i^{\text{n}}$	1.9	-317	-22 16	209 17	172 13	$f$	$d^2$	12.1	-388	-20 42	188 14	279 16	
$k^{\text{r}}$	13.9	-275	-24 47	221 57	184 53		$d^3$	9.4	-410	-22 58	189 45	280 47	
$k^2$	15.3	-261	-24 31	223 33	186 29		$d^4$	4.9	-368	-22 14	194 58	286 0	
$k$	18.9	-282	-27 9	226 18	189 14		$d^5$	0.6	-379	-24 29	208 15	289 17	
$k^3$	22.6	-280	-28 28	229 50	192 46	$f^3$	$e^{\text{r}}$	+2.9	-171	-13 54	206 50	297 52	
$l^{\text{s}}$	53.5	+135	-14 40	273 52	236 48	$i$	$e$	9.9	-51	-9 39	215 22	306 24	
$l^{\text{n}}$	54.4	+156				$k$	$f$	27.2	-431	-38 28	223 14	314 16	
$l^{\text{r}}$	58.1	+192	-12 58	282 45	245 41		$f^{\text{r}}$	29.4	-415	-38 16	225 59	317 1	
$l^2$	60.7	+208	-12 35	289 31	252 27		$f^2$	31.9	-438	-40 51	228 40	319 42	
April 30 0 <sup>h</sup> 2 <sup>m</sup>							$g^{\text{r}}$	33.5	+578	+18 23	256 29	347 31	$a^?$
$a$	-58.9	-95	+14 15	151 58	171 10		$g^{\text{n}}$	36.6	+576	+16 38	260 3	351 5	$a^{\text{r}}?$
$b$	55.9	-450	-5 29	137 39	156 51		$g^{\text{s}}$	37.5	+559				
$c$	54.3	-507	-9 2	135 3	154 15		$g^2$	40.5	+653	+21 5	271 19	2 21	
$d$	49.5	-345	-3 18	157 18	176 30		$h^{\text{r}}$	33.9	+46	-12 8	238 30	329 32	
$e$	40.5	-678	-24 28	144 4	163 16		$h$	34.4	+78	-10 29	239 38	330 40	$b$
$f$	38.6	-607	-21 47	154 58	174 10		$i$	43.4	+86	-12 48	249 11	340 13	
$f^{\text{r}}$	33.6	-594	-23 19	162 6	181 18		$i^{\text{r}}$	44.4	+46	-15 23	249 31	340 33	
$f^2$	33.8	-594	-27 38	172 26	191 38		$k$	50.9	+25	-18 34	257 24	348 26	
$f^3$	21.5	-596	-28 45	174 33	193 45		May 13 0 <sup>h</sup> 23 <sup>m</sup>						
$g^{\text{r}}$	35.7	-692	-27 38	150 33	169 45		$a$	-58.5	-35	+15 11	142 37	344 28	
$g$	34.6	-703	-28 45	150 52	170 4		$a^{\text{r}}$	55.9	-37	+14 8	146 46	348 37	
$h$	+2.7	+311	+12 12	223 41	242 53		$a^2$	55.4	-60	+12 35	147 4	348 55	
$h^{\text{r}}$	4.6	+302	+10 59	225 0	244 12	$a^{\text{r}}$	$b$	54.8	-462	-9 30	129 19	331 10	
$i^{\text{n}}$	7.8	-144				$b$	$c$	52.2	+85	+19 46	153 58	355 49	
$i^{\text{s}}$	9.3	-158	-15 22	216 47	235 59		$d^{\text{n}}$	20.3	+212				
$i^{\text{r}}$	14.4	-186	-19 27	220 51	240 3		$d^{\text{s}}$	19.4	+200	+15 21	189 27	31 18	
$k$	18.4	-33	-12 19	227 48	247 0	$b^{\text{r}}$	$d^{\text{r}}$	12.1	+273	+16 18	197 13	39 4	
$l$	45.0	-12	-20 31	254 19	273 31	$d$	$d^2$	7.8	+259	+18 39	200 21	42 12	
$l_1^{\text{r}}$	49.5	-9	-21 20	260 22	279 34	$d^2$	$d^3$	3.8	+316	+16 30	205 13	47 4	
$l_2^{\text{r}}$	50.0	-23	-22 18	260 52	280 4	$d^3$	$d^4$	2.7	+366	+19 7	207 23	49 14	
$l^2$	52.5	-16	-22 40	264 36	283 48		$d^{\text{s}}$	0.3	+346	+16 39	208 38	50 29	
$l^3$	55.5	-25	-24 4	269 16	288 28	$d^5$	$e^{\text{r}}$	17.3	+330	+11 0	190 21	32 12	
$m$	61.9	+221	-11 14	289 13	308 25	$e$	$e^{\text{n}}$	14.9	+145	+10 14	193 4	34 55	$a$
May 5 2 <sup>h</sup> 52 <sup>m</sup>							$e^{\text{s}}$	13.4	+159				
$a$	-58.5	-122	+11 44	147 36	238 38		$e^2$	9.8	+182	+10 40	197 18	39 9	
$a^{\text{r}}$	55.7	-97	+11 53	152 58	244 0		$e^3$	5.8	+218	+11 27	201 19	43 10	
							$e^4$	1.3	+257	+12 15	205 51	47 42	



1870 May 13—Continued

Letter	$\Delta\alpha$	$\Delta\delta$	b	L	L'	Letter on next date
<i>f</i>	+ 4 <sup>s</sup> 9	-374"	-25° 35'	196° 20'	38° 11'	
<i>g</i> <sub>1</sub> <sup>s</sup>	13.8	-227	-19 57	207 50	49 41	
<i>g</i> <sub>2</sub> <sup>s</sup>	14.7	-220	-19 31	210 17	52 8	<i>e</i>
<i>g</i> <sub>2</sub> <sup>n</sup>	15.4	-193	-19 49	213 57	55 48	
<i>g</i> <sup>1</sup>	17.8	-191	-18 8	216 9	58 0	
<i>g</i> <sup>2</sup>	20.4	-153	-20 50	216 39	58 30	
<i>g</i> <sup>3</sup>	22.1	-192	-19 40	219 8	60 59	
<i>g</i> <sup>4</sup>	23.4	-161	-21 13	221 37	63 28	
<i>g</i> <sup>5</sup>	25.5	-172	-10 48	212 35	54 26	<i>d</i>
<i>h</i> <sub>n</sub> <sup>s</sup>	15.0	- 51	+20 15	223 46	65 37	<i>b</i>
<i>h</i> <sub>s</sub> <sup>s</sup>	16.5	- 67	+20 24	226 57	68 48	
<i>i</i>	13.1	+470	+23 37	231 39	73 30	
<i>i</i> <sup>1</sup>	16.0	+488	+24 3	239 55	81 46	
<i>i</i> <sup>2</sup>	18.4	+552	+13 1	226 43	68 34	<i>c</i>
<i>i</i> <sup>3</sup>	25.0	+592	-28 37	222 0	63 51	
<i>k</i>	19.8	+384	+18 56	248 21	90 12	<i>f</i>
<i>l</i>	30.5	-283	+12 55	281 31	123 22	<i>h</i>
<i>m</i>	24.7	+558	-23 44	275 1	116 52	<i>i</i> <sup>1</sup> <i>i</i> <sup>2</sup>
<i>n</i>	54.3	+541	-26 35	280 11	122 2	
<i>o</i>	64.5	- 39	-22 43	282 55	124 46	<i>i</i> <sup>4</sup>
<i>o</i> <sup>1</sup>	65.6	- 83				
<i>o</i> <sup>2</sup>	66.3	- 18				

May 19 23<sup>h</sup> 58<sup>m</sup>

<i>a</i>	-66.1	-155	+10 5	111 52	37 38	
<i>b</i>	58.2	+ 55	+19 9	138 33	64 19	
<i>c</i>	54.2	- 16	+13 34	144 3	69 49	
<i>d</i> <sub>n</sub> <sup>s</sup>	53.6	-449	-11 38	127 57	53 43	
<i>e</i>	52.9	-474	-18 43	127 38	53 24	
<i>e</i> <sup>1</sup>	49.2	-550	-19 46	132 33	58 19	
<i>e</i> <sup>2</sup> <sub>1</sub>	48.2	-570	-19 48	139 6	64 52	
<i>e</i> <sup>2</sup> <sub>2</sub>	45.9	-561	-21 13	141 27	67 13	
<i>f</i>	42.5	-535	+19 56	162 14	88 0	
<i>f</i> <sup>1</sup>	40.2	-548	+20 17	163 34	89 20	
<i>g</i>	41.2	-541	-16 53	154 14	80 0	
<i>g</i> <sup>1</sup>	40.1	-563	-16 15	160 21	86 7	
<i>h</i> <sub>n</sub> <sup>s</sup>	34.0	+222	+13 14	193 58	119 44	
<i>h</i> <sup>1</sup>	29.3	+233	+13 38	195 24	121 10	
<i>i</i> <sup>1</sup>	6.2	+244	-23 21	191 19	117 5	
<i>i</i> <sup>2</sup>	+ 4.2	-350	-23 23	192 46	118 32	
<i>i</i> <sup>3</sup>	5.7	-343	-19 59	198 24	124 10	
<i>i</i> <sub>1</sub> <sup>4</sup>	10.2	-263	-21 36	200 30	126 16	
<i>i</i> <sub>2</sub> <sup>4</sup>	13.0	-270	-21 46	200 56	126 42	

<i>i</i> <sub>1</sub> <sup>s</sup>	+23 <sup>s</sup> 1	-267"	-23° 19'	209° 57'	135° 43'	
<i>i</i> <sub>2</sub> <sup>s</sup>	23.8	-242	-23 1	211 18	137 4	
<i>i</i> <sub>3</sub> <sup>s</sup>	24.8	-254	-24 19	211 26	137 12	
<i>i</i> <sub>3</sub> <sup>n</sup>	23.8	-233	-29 51	212 32	138 18	
<i>i</i> <sup>5</sup>	25.7	-274	-24 55	214 42	140 28	
<i>i</i> <sup>6</sup>	27.0	-251	-23 14	222 8	147 54	
<i>i</i> <sup>8</sup>	27.0	-340	-25 56	221 40	147 26	
<i>i</i> <sup>9</sup>	28.1	-256	+ 92	215 10	140 56	
<i>k</i> <sub>n</sub> <sup>s</sup>	34.7	-196	+ 74	220 16	146 2	
<i>k</i> <sub>s</sub> <sup>s</sup>	34.7	-240	-10 0	246 22	172 8	
<i>l</i> <sub>n</sub> <sup>s</sup>	21.6	+ 92	+13 18	240 39	166 25	<i>a</i>
<i>l</i> <sub>s</sub> <sup>s</sup>	22.8	+ 74	+13 18	256 58	182 44	
<i>m</i>	29.7	+ 12	-23 0	251 20	177 6	<i>b</i>
<i>n</i>	34.5	+628	+ 2 35	269 22	195 8	<i>c</i> ? <i>c</i> <sup>1</sup>
<i>n</i>	38.3	+451	-127	271 19	197 5	<i>d</i>
<i>o</i>	51.9	+420	-109	272 43	198 29	<i>d</i> <sup>2</sup>
<i>p</i> <sub>n</sub> <sup>s</sup>	57.1	- 81				
<i>p</i> <sub>s</sub> <sup>s</sup>	57.1	- 97				
<i>q</i>	59.9	+356				
<i>r</i> <sub>n</sub> <sup>s</sup>	65.2	-127				
<i>r</i> <sub>n</sub> <sup>s</sup>	65.2	-109				
<i>r</i> <sup>1</sup>	65.8	- 71				

May 27 0<sup>h</sup> 9<sup>m</sup>

<i>a</i>	-59.7	- 2	+14 20	128 3	166 15	
<i>b</i> <sub>n</sub> <sup>s</sup>	37.0	-516	-22 6	141 22	179 34	<i>a</i>
<i>c</i>	35.9	-527	+ 2 28	154 27	192 39	<i>a</i>
<i>c</i> <sup>1</sup>	37.0	-102	+ 2 28	156 7	194 19	
<i>c</i> <sup>2</sup>	35.4	- 95	+ 0 30	160 30	198 42	
<i>d</i> <sup>1</sup>	30.4	-107	-21 39	159 11	197 23	
<i>d</i> <sup>2</sup>	21.9	-449	-23 59	159 27	197 39	
<i>d</i> <sup>3</sup>	20.4	-480	-22 54	161 9	199 21	
<i>d</i> <sub>n</sub> <sup>s</sup>	19.4	-458	-26 21	160 58	199 10	<i>b</i>
<i>d</i> <sub>s</sub> <sup>s</sup>	18.5	-496	-23 25	166 14	204 26	
<i>d</i> <sup>4</sup>	17.0	-516	-23 45	168 13	206 25	
<i>d</i> <sup>5</sup>	14.3	-444	-27 23	173 59	212 11	<i>d</i>
<i>e</i> <sub>n</sub> <sup>s</sup>	12.2	-440	-26 27	182 12	220 24	
<i>e</i> <sup>1</sup>	4.9	-478	-26 54	186 50	225 2	
<i>e</i> <sup>2</sup>	+ 0.3	-417	-18 5	183 22	221 34	<i>c</i> <sup>1</sup>
<i>f</i> <sup>1</sup>	7.9	-403	-18 0	186 31	224 43	<i>c</i> <sup>2</sup>
<i>f</i> <sup>2</sup>	1.2	-289	-19 12	196 32	234 44	<i>c</i>
<i>f</i> <sup>3</sup>	4.6	-273	-19 14	201 4	239 16	<i>c</i> <sup>5</sup>
<i>g</i> <sub>n</sub> <sup>s</sup>	15.7	-245	+19 45	205 15	243 27	<i>e</i>
<i>g</i> <sup>1</sup>	20.5	-225	+22 17	207 26	245 38	
<i>g</i> <sup>2</sup>	11.4	+394	+21 57	211 13	249 25	<i>e</i> <sup>1</sup>

Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date	Letter	$\Delta a$	$\Delta \delta$	b	L	L'	Letter on next date
1870 May 27—Continued							<i>c</i>	-26.6	-420''	-18° 56'	153° 16'	235° 27'	
<i>g</i> <sup>3</sup>	+16.3	+489''	+23° 53'	212° 15'	250° 27'	<i>f</i>	<i>c</i> <sup>3</sup>	25.2	-431	-19 57	154 13	136 24	
<i>h</i>	35.8	+394	+13 8	227 30	265 42		<i>c</i> <sup>4</sup>	21.8	-413	-19 42	157 56	240 7	
<i>h</i> <sup>1</sup>	38.2	+390	+12 21	229 49	268 1	<i>f</i> <sup>1</sup>	<i>c</i> <sup>5</sup>	21.2	-399	-19 1	158 58	241 9	
<i>h</i> <sup>2</sup>	40.9	+408	+12 45	233 29	271 41		<i>d</i> <sup>n</sup>	39.1	-604	-27 42	130 32	212 43	
<i>i</i>	50.1	+579	+21 3	258 34	296 46	<i>h</i>	<i>s</i>	38.1	-615				
<i>k</i> <sup>s</sup> <sub>n</sub>	52.5	-123				<i>g</i>	<i>e</i> <sup>s</sup>	31.0	+232	+20 35	162 17	244 28	
	53.4	-105	-20 42	236 46	274 58		<i>n</i>	29.9	+241				
May 30 3 <sup>h</sup> 23 <sup>m</sup>							<i>e</i> <sup>1</sup>	25.2	+278	+21 50	167 40	249 51	
<i>a</i>	-64.3	-200	+ 3 7	110 18	192 29		<i>f</i>	5.9	+204	+12 39	183 23	265 34	
<i>b</i> <sup>1</sup>	45.6	-613	-26 3	119 10	201 21		<i>f</i> <sup>1</sup>	+ 1.6	+255	+13 54	190 28	272 39	
<i>b</i>	44.6	-630	-27 24	119 5	201 16		<i>g</i> <sup>n</sup>	14.9	-257	-19 49	193 24	275 35	
<i>c</i> <sup>1</sup>	40.6	-458	-17 46	137 16	219 27		<i>s</i>	16.2	-273				
<i>c</i> <sup>2</sup>	36.0	-431	-17 18	143 31	225 42		<i>g</i> <sup>1</sup>	19.1	-269	-20 55	196 29	278 40	
							<i>h</i>	25.1	+470	+21 22	216 23	298 34	
							<i>h</i> <sup>1</sup>	34.3	+512	+21 48	227 24	309 35	
							<i>i</i>	37.7	+517	+21 17	231 32	313 43	
							<i>i</i> <sup>1</sup>	60.5	+440	+11 34	272 53	355 4	



# DATES ON WHICH THE SUN WAS OBSERVED TO BE FREE FROM SPOTS

1865 April 7.  
       June 21.  
       July 3.  
       October 20, 21, 22, 23, 24.  
       November 1.  
       December 9, 25.  
 1866 April 29, 30.  
       May 6.  
       July 24, 27, 31.  
       September 9, 10, 12, 14, 15.  
       October 8, 11.  
       November 4, 5, 6, 7, 8, 10, 13, 14.  
       December 1, 14, 20, 21.  
 1867 January 7, 8, 10, 12, 14, 18, 20, 30.  
       February 6, 7, 19, 24.  
       March 1, 6, 8, 10.  
       April 12, 25, 28.  
       May 2, 12, 16.  
       June 9, 13, 19, 24, 29.  
       July 7, 28, 31.  
       August 5, 9, 14, 25, 30.  
       September 3, 4, 23, 25, 28.  
       October 19, 21, 23, 25, 27.  
       November 1.  
       December 13.  
 1868 January 16, 19, 22, 28.  
       February 14, 16.  
       May 25.  
       July 9.  
       Total, 91 days.



# AUTHOR'S NOTES ON WEATHER CONDITIONS DURING OBSERVATIONS

- 1860 June 14. Hazy; the spots very dim.  
 17. Clear sky with clouds.  
 18. Clear sky.  
 19. Many clouds but clear between them; limb and spot much undulating.  
 20. Hazy and many clouds. Observation in clear sky between the clouds.  
 27. Clear sky; the observations with interruptions by clouds.  
 28. Many clouds, though sky clear.
- July 4. Sky clear with clouds.  
 6. Sky clear, without clouds, and calm.  
 7. Clear; interrupted by many clouds. Limbs much undulating.  
 8. Interrupted by many clouds.  
 9. Many clouds.  
 11. Very clear; strong wind.  
 15. Sky clear with clouds.  
 18. Hazy toward noon.  
 20. Clear.  
 22. Clear sky.  
 24. Clear; strong wind; limb tremulous.  
 28. Clear; but limbs as well as spots tremulous.  
 30. Clear with clouds.  
 31. Clouds intervened so that only two sets in R. A. could be obtained.
- Aug. 1. Clear sky, almost cloudless; the limbs somewhat undulating.  
 3. Hazy.  
 5. Very clear and calm.  
 6. Very clear and calm; cloudless.  
 15. Limbs much undulating.  
 16. A little hazy.  
 17. Clear with clouds; limbs undulating.  
 18. Many clouds.  
 19. Clear and very calm.  
 20. Many clouds.
- Sept. 15. Clear sky.  
 17. Many clouds.  
 18. Clear sky.  
 20. Observations with interruptions by clouds.  
 22. Strong wind, almost a storm. Limbs and spots much trembling.  
 23. Clear.  
 24. Clear but a strong gale is shaking the telescope.  
 25. Many clouds, and observations for that reason hurried.  
 26. Violent gale; clear.  
 28. Strong wind; great many clouds.  
 30. Clear and calm. Spots very much undulating, perhaps from the sun heating the roof.
- Oct. 6. Clear with clouds.  
 7. Clear and calm.  
 10. Clear sky.  
 12. Clear.  
 15. Hazy.  
 16. Hazy, but images steady.  
 18. Hazy.  
 19. Calm though a little hazy; undulating.  
 24. With clouds.  
 25. Clear with a few clouds. Limbs much undulating.  
 27. Clear with clouds, the spots, however, very badly swimming.
- Oct. 30. Very thickly hazy.  
 31. Great many clouds; almost overcast.
- Nov. 4. Many clouds.  
 5. Great many clouds.  
 7. Many clouds.  
 8. Fine and clear; then clouds arising and the limbs undulating.  
 16. Many clouds.  
 22. Clear and calm.  
 24. Suddenly cleared up after a snow storm.  
 25. Hazy with clouds.  
 28. Clear and calm.
- Dec. 14. Clear and calm; the spots swimming, however.  
 15. Clear sky, but limbs and spots very much waving and swimming. No sharp view of the spots could be obtained but for short moments.  
 23. Images steady though rather dim, the sky being hazy.
- 1861 Jan. 2. Clear, and images rather steady.  
 4. Hazy and very dim; spots indistinct.  
 5. Spots sharp and distinct.  
 12. Hazy, and clouds after third set.  
 22. Clear and bright.  
 23. Smoky; images dull; smaller spots invisible.  
 25. Hazy; steady and pretty distinct images.  
 27. Spots swimming in the beginning; then more steady.
- Feb. 1. Clear with cirrhi. Steady; all the spots small; the whole disk mottled. ;  
 6. Clear; spots distinct; wind.  
 12. Clear and fine; steady, sharply defined images.  
 14. Very hazy; only the large spots visible, and then, too, very dim.  
 16. Clear and very distinct.  
 22. While making sketch perfectly clear; then hazy so that the smaller spots only dim.  
 25. Pretty clear, little haze; at times unsteady.  
 26. Clear though the spots somewhat swimming.  
 27. Clear.  
 28. Rather hazy.
- Mar. 4. Hazy; the penumbras very indistinct; later clearer.  
 7. Clear, but swimming images; strong W. N. W. wind.  
 11. Clear.  
 15. Hazy; images ill-defined.  
 16. Clear.  
 18. Clear and cold; spots much swimming.  
 19. Clear, though spots badly swimming.  
 20. Clear.  
 22. Clear.  
 23. Clear; wind E.; afterwards hazy.  
 25. Very hazy, especially at the end of the observations.  
 28. Clear.
- Apr. 31. Very clear, but limbs and spots much undulating.  
 4. Very clear and calm.  
 5. Clear, bright, and pretty steady, though heavy west wind.  
 6. Clear, spots a little blurred; wind E.  
 7. Hazy, with clouds; the spots and limbs very steady and well seen.  
 8. Clear.  
 9. Clear; strong E. wind; spots distinct, limbs undulating.  
 10. Clear; E. wind; spots and limbs a little dancing.  
 11. Clear; spots a little swimming.  
 19. Many clouds.

- 1861 Apr. 21. Clear; strong W. wind; undulation of limbs.  
 22. Very hazy.  
 23. Rather clear.  
 25. Strong wind and many clouds.  
 26. Clear but stormy.  
 27. Clear; some interruptions by clouds.  
 29. Clear; the W. wind sometimes shaking the telescope.
- May 2. Clear; strong W. wind.  
 4. Clear but unsteady.  
 5. Clear and calm.  
 7. Very clear, after rain storm; strong wind.  
 9. Many clouds.  
 12. Clear and steady.  
 14. Clear, immediately after rain; heavy W. wind.  
 15. Clear.  
 19. Steady; a little hazy.  
 21. Very clear, with many clouds; between second and third sets little showers of rain.  
 23. Clear and calm.  
 25. By polarizing eyepiece and scale. The positions today rather uncertain.  
 30. By polarizing eyepiece and scale.  
 31. By polarizing eyepiece and scale; perfectly clear and calm.
- June 1. Clear; at times some haze.  
 5. Clear with clouds; wind E.  
 7. Clear.  
 9. Clear and steady.  
 10. Clear but unsteady; strong wind; some haze.  
 12. Quite clear, but strong gale.  
 13. Clear with clouds; stormy, the telescope shaking.  
 17. Clear with clouds; wind N.  
 18. In the beginning clear with clouds; then hazy.  
 20. Clear with flying clouds.  
 22. Clear and calm with clouds.  
 24. Clear with many clouds. Strong W. wind.  
 25. Pretty clear, though somewhat hazy.  
 27. Clear; strong W. wind.
- July 29. Very clear.  
 1. Very hazy.  
 3. Very clear.  
 5. Very clear and steady.  
 7. Hazy with clouds, sometimes very clear.  
 9. Very clear, when not covered by any of the flying clouds.  
 11. Many clouds, though very clear between them.  
 17. Clear and calm.  
 19. Very hazy.  
 21. Very clear with clouds.  
 23. Clear.  
 25. Bright and clear.  
 27. Clear and bright.
- Aug. 1. Clear.  
 2. Clear.  
 4. Clear though stormy S. W. wind.  
 11. Clear and bright. Limbs undulating.  
 14. Clear between clouds.  
 16. Clear with clouds.  
 18. Clear with many clouds.  
 19. Very hazy.
- Sept. 7. Clear with clouds.  
 9. Hazy with clouds. Limbs and spots undulating.  
 12. Many clouds, else clear.  
 15. Very cloudy and hazy.  
 22. Clear with clouds.  
 24. Clear; many clouds.  
 26. Clear.  
 29. Many clouds.
- Oct. 1. Clear.  
 8. Hazy and thin clouds.  
 10. Very clear.  
 12. Limbs very much undulating after rain. Sky clear between clouds.  
 14. Clear.  
 20. Clear gaps between clouds.  
 21. Clear.  
 25. Clear; a little hazy.  
 26. Hazy; sometimes clear.  
 27. On account of clouds, got only two sets in R. A.  
 28. Perfectly clear, but badly swimming.  
 29. Very clear and rather steady.
- Nov. 1. Little hazy.  
 10. Clear, but limbs and spots badly swimming.  
 12. Pretty clear, with some clouds; strong W. wind.  
 14. Many clouds; strong W. wind.  
 15. Clear.  
 18. Extremely hazy during the observations, so that of the fainter spots only one set in R. A. could be obtained; of the larger ones, two.  
 19. Beautifully clear.  
 20. Clear with thin clouds.  
 22. Pretty clear, sometimes a little hazy and blurred.  
 24. Very hazy, though steady; later clearer.  
 25. Clear while making the sketch; thin hazy clouds; very steady images.  
 26. Very fine, clear and calm.  
 27. Extremely hazy after finishing the sketch. Observations difficult; halo around the sun.
- Dec. 2. Very clear and steady, though strong W. wind.  
 3. Through gaps between the clouds. Sometimes pretty clear. Limbs much undulating.  
 4. Clear while making the sketch. After that it became hazy.  
 5. Clear, the spots steady, but the sun's limbs undulating.  
 7. Clear but very much undulating.  
 10. Clear, somewhat hazy; undulating.  
 11. Very clear, but unsteady. A gale is blowing from the W. The narrowness of the dome did not permit to read more than a few declinations, the sun being already low.  
 12. Clear and calm, but spots sometimes much blurring.  
 13. Clear; images sharp and rather steady.  
 14. Remarkably steady and fine; a little hazy.  
 15. Clear and pretty steady.  
 16. A little hazy; spots, however, very neatly defined, though a strong gale blowing from W.  
 17. Clear, steady, and well defined.  
 22. Very hazy; spots calm, but very dim and the smaller spots not visible. Fine halo with colors.  
 25. Quite clear; blurring.  
 28. Very clear and rather calm.  
 30. Sky almost overcast with a few gaps between clouds.  
 31. It suddenly cleared up for an hour and was very fine during the observations.
- 1862 Jan. 2. A terrible gale from the W. had blown the whole night, still continuing though with less severity. The sky is very clear. The sun's limbs sometimes undulating strongly.  
 3. Clear.  
 4. Clear, somewhat undulating.  
 7. Images very neat and steady.  
 11. Hazy, the dots visible only at times; limbs undulating.  
 13. Clear during the sets of R. A., but while reading the declinations many clouds and limbs undulating.

- 1862 Jan. 14. Fine, clear; spots beautifully well defined; solar limbs a little undulating.  
 16. Many clouds; clear while observing, but strong gale from the W. shaking the telescope.  
 24. Clear; moderately sharp images.  
 27. Very clear and pretty steady.  
 31. Very clear, but limbs and spots badly swimming; sky without clouds.
- Feb. 5. Thin clouds, images at times very sharp and distinct.  
 7. Clear and pretty steady; sometimes undulations produced by passing clouds.  
 8. Very hazy; images sometimes, however, quite distinct and calm.  
 11. Clear and steady.  
 16. Images neat and steady.
- Mar. 8. Some haze; images calm and well defined.  
 9. Clear; images neat; little hazy.  
 11. Clear and well defined; some few clouds.  
 13. Hazy; somewhat undulating  
 18. Suddenly cleared up; pretty strong W. wind; images neat and steady.  
 19. Clear and pretty steady.  
 20. Clear; some haze; images a little unsteady.  
 25. Very clear; strong W. wind.  
 26. Very clear; heavy W. wind.  
 27. Pretty clear, steady and neat.  
 28. Clear, but not very steady; strong N. W. wind.  
 29. Clear, but images not very sharp; undulating.
- Apr. 4. Clear, little hazy; steady.  
 6. Many clouds; sometimes very clear for short intervals. Strong W. gale.  
 7. Hazy; limbs a little undulating.  
 9. Clear; good images.  
 10. Clear and fine.  
 11. Fine, clear and steady.  
 12. Fine and clear.  
 13. Clear.  
 20. Very hazy though steady.  
 22. Clear with many clouds; wind shaking telescope.  
 24. Clear; strong wind from W.  
 25. Very hazy though calm; spots undulating.  
 26. Clear and distinct.  
 27. Many clouds; limbs undulating; at times the sky pretty clear.
- May 4. Clear and fine between many clouds.  
 5. Very clear between the clouds; strong W. wind.  
 6. Clear, but a very strong gale from W. shaking telescope.  
 8. Clear but windy.  
 10. Very clear, but strong W. wind which produces at times undulations.  
 11. Clear and fine.  
 12. Clear.  
 14. Very fine and clear.  
 15. Quite clear; spots a little undulating.  
 17. Clear, with clouds; limbs undulating.  
 20. Clear; the limbs a little undulating.  
 22. Clear, with clouds; the wind blowing a gale from the W.  
 24. Clear; wind.  
 26. Hazy, still sufficiently clear for the small dots. S. wind sometimes shaking the telescope.  
 28. Clear, but strong wind.  
 30. Clear, but very hazy after second set of measurements.
- June 5. Hazy in the beginning, then very clear; steady.  
 8. Clear, with many clouds; not very steady.  
 20. Clear, some clouds.  
 22. Clear, with many clouds.
- June 26. Clear and steady.  
 29. Clear and pretty steady, though S. wind.
- July 1. Clear.  
 3. Very clear, with clouds; wind E.; spots somewhat swimming.  
 6. Hazy; the solar disk on the projection table reddish; the spots, however, neat and steady.  
 7. Veil of haze over the sky rather thick.  
 8. Many clouds, clear between; limbs undulating.  
 10. Clear.  
 11. Very clear.  
 13. Hazy and clouds; limbs undulating.  
 15. Interrupted by cloudiness so that not all of the declinations could be read off.  
 18. Many clouds; limbs undulating strongly, sometimes also the spots.  
 19. Clear, not very steady; wind S.  
 25. Clear, some clouds.  
 27. Clear, somewhat undulating.  
 29. Clear, with flying clouds; limbs very much undulating.  
 31. Quite clear and pretty steady; a little windy.
- Aug. 2. Haze and clouds in the beginning, then very clear.  
 4. Many clouds; limbs undulating; wind E.  
 6. Clear, with clouds; strong wind; images a little blurred.  
 8. Many clouds; at times very clear; wind.  
 10. Clear and well defined.  
 12. Very clear and images neat; strong wind.  
 14. Thick cloudy haze; difficult observation.  
 15. Very clear and calm.  
 17. Many clouds, very clear between; strong W. wind.  
 18. Quite clear, but spots sometimes badly swimming.  
 20. Clear, but limbs strongly undulating; wind S.  
 22. Very clear, though strong S. wind.  
 24. Clear, but bad swimming of images.  
 26. Very clear and steady.  
 29. Clear, with clouds; images rather unsteady; strong W. wind.  
 31. Very clear, though images not quite without undulations.
- Sept. 3. Very clear though somewhat undulating.  
 5. At times pretty clear; undulating; S. wind.  
 7. Many clouds, sometimes very clear; S. wind.  
 9. Many clouds; strong undulations.  
 11. Clear, but strong undulations of limbs.  
 13. Clear.  
 15. Very clear; images very fine and neat.  
 17. Very clear and neat between the clouds; strong S. wind.  
 19. Clear and pretty. In second set some clouds.  
 22. Clear with clouds; limbs sometimes strongly undulating.  
 23. Very clear and fine; steady.  
 25. Clear and steady.  
 27. Very clear; sometimes strong undulations of limbs.
- Oct. 3. Through clouds; sky almost entirely covered. Clear at noon for a moment when the sketch was made.  
 5. Strong gale from N. W. and images in great undulation (undulations on limb retrograde).  
 7. Neat and clear.  
 12. Hazy, though steady and spots well seen.  
 15. Hazy, many clouds; sometimes clear.  
 18. Clear with some clouds intervening.  
 20. Clear with strong W. wind; undulating limbs.  
 23. Very clear, but many clouds, and strong W. gale.  
 28. Very clear and steady; haze at the end while reading the declinations.  
 31. Images very neat and fine; very steady.
- Nov. 2. Very hazy; limbs undulating; smaller spots visible only at intervals.



- 1862 Nov. 4. Very clear; spots sometimes swimming.  
 11. Sky without clouds; limbs and spots badly swimming and dancing.  
 14. Very clear; steady.  
 15. Clear; limbs a little undulating; wind N. W.  
 25. A little hazy; images very good and sharp.  
 30. Hazy, though the two spots were seen sometimes; neat images.
- Dec. 11. Clear, but strong undulations.  
 12. Very clear and neat images.  
 17. Clear between many clouds.  
 20. Clear, but strong N. wind, and limbs and spots much undulating.
- 1863 Jan. 18. Quite clear, but spots badly swimming.  
 19. Hazy; limbs undulating.  
 25. Clear and steady.  
 30. Very fine images, though near the end of the observations some haze or thin clouds.  
 31. Clear and fine.
- Feb. 2. Clear; heavy W. gale shaking telescope.  
 4. Sky entirely clear, but limbs and spots horribly blurring; only the larger spots visible.  
 8. Hazy; at times rather thick.  
 11. Haze, though limbs and spots pretty neat.  
 14. Cloudless, but spots and limbs badly swimming.  
 15. Clear, between many clouds; at the close hazy.  
 16. Very fine and clear, though the telescope is badly shaken by the wind.  
 17. Clear, sometimes blurring.  
 18. Steady; very hazy, so that smaller spots invisible.  
 21. Clear; but strong wind shaking telescope.  
 23. Clear and fine.  
 25. Very fine and clear.  
 28. Clear; blurring.
- Mar. 2. When the sketch was made at noon the sky was beautifully clear. Then it clouded up and the observations could not be obtained until the sun was low, and its limbs already a little undulating. Still the images of spots neat.  
 4. Clear; strong N. W. wind sometimes shaking the telescope.  
 5. Clear, but much blurring.  
 9. Clear between clouds; blowing awfully.  
 10. Neat images and calm, though thin clouds.  
 11. Clear and fine, toward the close some wind.  
 12. Sky very heavy; cold W. wind; spots swimming.  
 13. Haze rather thick, spots and limbs much blurring.  
 14. Hazy and cloudy; strong W. wind.  
 15. Clear; spots and limbs much blurring.  
 16. Hazy, though steady and well defined.  
 18. Clear; neat images.  
 19. Clear and fine.  
 20. Clear; spots very much swimming, limbs blurring.  
 30. Very fine, clear, and steady.
- Apr. 3. Clear.  
 4. Clear; limbs undulating a little.  
 9. Quite clear; strong W. wind.  
 11. Haze very thick; the dots are seen with difficulty; strong S. W. wind.  
 13. Fine and clear; calm.  
 14. Fine and clear.  
 19. Very fine day.  
 21. Hazy; though spots well seen with some undulations of limbs.  
 22. Quite clear; limbs at times undulating.  
 23. Steady; some haze.

- Apr. 24. Hazy.  
 26. Clear, but strong W. wind; limbs strongly undulating.  
 29. Thick haze and clouds; E. wind.  
 30. Clear and fine.
- May 1. Clear and fine.  
 2. Smoky sky.  
 3. Smoky sky; wind E.; limbs and spots undulating a little.  
 5. Very hazy or cloudy, sometimes clear.  
 8. Clear, neat, and pretty steady.  
 9. Rather hazy, though sufficiently clear and steady.  
 10. Steady, but very hazy.  
 11. Very clear.  
 13. Clear.  
 17. Clear with many clouds.  
 19. Clear and fine; a little trembling by wind.  
 21. Very fine and steady images; sky rather hazy.  
 23. Steady; hazy.  
 26. Fine, clear; little undulation of limbs.  
 28. Clear and steady.  
 30. Very clear: S. wind.
- June 4. Clear with clouds.  
 9. Very hazy, and strong N. W. wind.  
 11. Clear with clouds; wind E.  
 13. Clear; undulating.  
 15. Clear; strong W. wind.  
 18. Very hazy.  
 20. Hazy though steady.  
 22. Many clouds, and soon overcast.  
 24. Very clear, between many clouds.  
 26. Clear, little undulating.  
 28. Clear.  
 30. Almost entirely overcast.
- July 2. Clear with many clouds; limbs undulating.  
 4. Many clouds, but otherwise clear.  
 18. Nicely clear.  
 20. Very clear with clouds; limbs undulating.  
 22. Clear.  
 24. Clear; limbs swimming.  
 28. Clear, some haze; undulating.
- Aug. 2. Clear and steady.  
 7. Clear, a little hazy, calm.  
 9. Clear, interrupted by clouds; limbs sometimes undulating.  
 11. Clear, with clouds; undulations.  
 13. Clear; spots sometimes dancing.  
 15. Hazy, with many clouds.  
 17. Clear; some undulations.
- 1864 Nov. 2. Clear, but undulations by strong wind.  
 6. Clear, strong S. wind.  
 7. Very hazy with clouds; only the larger spots well visible but pale; wind S.  
 10. Clear with clouds; strong W. wind; heavy undulations.  
 14. Clear.  
 18. Between clouds and with hazy sky.  
 19. Fine and beautiful; calm.  
 22. Cleared up after a rain and snow storm; spots neat.  
 25. Through haze and clouds; sometimes more distinctly seen.
- Dec. 1. W. wind, warm, clear, with clouds, then hazy.  
 8. Heavy W. wind after storm and many clouds; images very much trembling.  
 9. Clear and steady.  
 13. Spots badly swimming and undulating; a little hazy.  
 18. Clear and fine; calm; spots and limbs, however, badly swimming, except in the last two sets.  
 20. Clear.

- 1864 Dec. 22. Clear, but not very steady; wind W., blowing hard.  
 25. Clear, but S. wind gives very bad images.  
 27. Hazy and many clouds, with S. wind.  
 31. Suddenly cleared up after snowstorm, distinct and pretty calm.
- 1865 Jan. 2. Clear, between clouds of haze.  
 8. Clear.  
 11. Clear and steady.  
 12. Clear and steady, undulating at the close.  
 16. Clear and sharp; telescope sometimes trembling from strong W. wind.  
 18. Clear and fine.  
 20. Beautiful sky; clear, sharp, and steady.  
 24. Clear between clouds with heavy W. wind sometimes shaking the telescope.  
 25. Clear with many clouds and strong W. wind.  
 27. Haze rather thick; images calm.
- Feb. 2. Clear with fresh W. wind.  
 12. Very hazy.  
 13. Clear and fine.  
 15. Very hazy.  
 17. Clear; blurring.  
 18. Hazy, though images well defined; strong W. wind.  
 21. Sky quite clear; the spots and limbs swimming and undulating.  
 24. Perfectly clear; blurring.  
 27. Quite clear; limbs a little undulating
- Mar. 5. Calm and pretty clear; a little hazy.  
 6. Clear, though very much blurring.  
 10. Storm from the W. shaking the telescope; clouds and snowdrift.  
 11. Clear and steady.  
 12. Clear and cold.  
 14. Steady, but rather hazy.  
 16. Clear with clouds; strong S. wind.  
 17. Images well defined though observed through clear gaps between many clouds; strong W. wind.  
 19. Clear, neat, and well defined images.  
 21. Hazy, calm; limbs a little undulating.  
 23. Clear; images well defined; wind from west rather strong.  
 27. Clear and fine.  
 28. Clear and fine, though limbs undulating
- Apr. 1. Clear between clouds; strong W. wind.  
 2. Very clear and sharply defined limbs; strong N. W. wind.  
 9. Clear; blurring.  
 13. Very clear between clouds; strong W. wind.  
 17. Clear but extremely blurring images.  
 19. Clear, a little hazy.  
 24. Very clear with clouds and strong W. wind.  
 26. Clear between clouds; strong S. wind.  
 27. Clear in the beginning, then becoming suddenly overcast so that only two sets in R. A. and only part of the declination were obtained.  
 30. Clear.
- May 2. Clear sky with clouds; calm.  
 3. Clear, many clouds with rather strong wind.  
 5. Hazy; thin clouds; wind E.  
 7. Clear between clouds.  
 12. Clear; sometimes strong undulations.  
 13. Clear; not without undulations.  
 15. Clear.  
 17. Hazy; pretty steady.  
 21. Clear with clouds.  
 23. Many clouds, clear between.  
 26. Clear and fine.
- May 30. Fine and clear; wind strong, W.  
 31. Hazy, but images clear and well defined; steady.
- June 1. Clear, and pretty steady.  
 2. Smoky sky; spots, however, distinct.  
 4. Clear and fine images, notwithstanding clouds and wind.  
 7. Clear and fine.  
 8. Clear and steady, somewhat blurred.  
 11. Clear and fine between the clouds.  
 12. Clear.  
 14. Clear.  
 17. Very fine and clear.  
 23. Clear and fine.  
 27. Clear.  
 28. Clear and fine; wind W., rather strong.  
 29. Clear.  
 30. Clear with many clouds.
- July 2. Clear; undulations; strong W. wind.  
 5. Fine and clear; the strong W. wind annoying.  
 8. Clear with many clouds; limbs undulating.  
 9. Clear, undulations with W. wind.  
 10. A little hazy; blurring images.  
 11. Fine and clear; sometimes clouds.  
 17. Clear and fine between clouds.  
 18. Little hazy.  
 21. Clear.  
 23. Clear and fine.  
 27. Fine and clear.  
 29. Clear with many clouds.  
 30. Clear; limbs a little undulating.
- Aug. 4. Clear.  
 8. Clear.  
 9. Clear and calm.  
 12. Clear.  
 14. Clear; blurring images.  
 16. Hazy with clouds.  
 18. Clear.  
 19. Clear and distinct.  
 20. Clear.  
 24. Clear with many clouds; strong W. wind.  
 26. Clear and rather fine.  
 27. Clear, between many clouds.
- Sept. 6. Clear and fine.  
 7. Hazy, calm and steady.  
 10. Many clouds; strong S. W. wind.  
 12. Fine and clear.  
 14. Clear with many clouds.  
 15. Clear.  
 17. Many clouds; very clear between them.  
 19. Clear and fine between clouds.  
 22. Very clear; little undulations.  
 24. Clear with wind and clouds.  
 25. Very clear after rain; strong W. wind.  
 27. Very calm and quite serene; images blurring with S. E. wind.  
 29. Very fine, clear and steady.
- Oct. 1. Very clear and fine between the clouds.  
 3. Clear between many clouds.  
 6. Very clear, with clouds; strong W. wind.  
 9. Clear.  
 11. Very fine and steady.  
 13. Clear, but strong undulations.  
 16. Very many clouds; strong N. W. wind.  
 17. Clear; a little haze; calm.  
 19. Very many clouds; clear between them; images steady.
- Nov. 11. Very hazy; limbs and spots not very distinct.  
 13. Steady images, but sky very thick.  
 15. Very thick haze; later the sky better, though still hazy.

- 1865 Nov. 16. Clear; limbs undulating.  
 24. Clear with clouds.  
 26. Clear between many clouds; blurring.  
 27. Gaps between many clouds.  
 30. Undulating.
- Dec. 3. Very smoky; limbs and images very sharp and steady.  
 5. Quite clear; strong undulations; fresh N. W. wind.  
 11. A little hazy; images steady; S. wind.  
 16. Rather hazy.  
 22. Clear; blurring images.  
 23. Clear.  
 31. Clear; some undulations; S. wind.
- 1866 Jan. 3. Clear and tolerably steady.  
 5. Images very bad, indistinct and blurring.  
 7. Badly blurring.  
 9. Pretty good images.  
 14. Sky clear; images undulating and swimming.  
 17. Hazy with S. W. winds  
 18. Fine and pretty steady.  
 22. Clear between clouds; strong W. wind.  
 23. Very hazy and spots extremely dim.  
 24. A little hazy.  
 27. Much blurred.  
 31. Steady; clear in the beginning and then clouding up.
- Feb. 5. Hazy clouds coming up; images rather steady and distinct.  
 7. Extremely undulating and blurring.  
 15. Wind strong after a snow storm; images undulating.  
 16. Clear and images well defined.  
 17. Clear; undulating limbs.  
 22. Hazy, then overcast.  
 26. Clear, blurred images.  
 28. Hazy, though calm and steady.
- Mar. 1. Clear between hazy clouds; steady.  
 2. Clear with haze; calm.  
 3. Fine and tolerably steady images.  
 6. Clear; well defined images; strong wind.  
 8. Between many clouds.  
 10. Quite clear; limbs a little undulating.  
 17. Clear with many clouds and strong W. wind.  
 19. Clear with many clouds; steady images.  
 22. Clear, between many clouds; fine.  
 27. Clear; images rather steady.  
 30. Clear, between many clouds.
- Apr. 2. Steady, but very hazy.  
 3. Very clear and fine, though some undulations.  
 4. Clear, steady.  
 5. Clear, the wind sometimes moving the telescope.  
 8. Clear.  
 9. Clear and fine.  
 10. Hazy.  
 11. Clear with some clouds; steady images.  
 13. Clear between clouds; strong W. wind.  
 14. Hazy, somewhat undulating.  
 15. Clear and fine.  
 17. Clear and fine.  
 20. Clear and steady, with many clouds.  
 23. Beautifully clear; a little wind.  
 27. Clear; undulating limbs, with strong W. wind.
- May 4. Clear; strong W. wind.  
 15. Clear.  
 17. Clear; undulating limbs.  
 19. Clear, a little hazy; sharply defined images.  
 20. Clear and fine.  
 24. A little hazy; steady images.  
 30. Clear with clouds.
- June 1. Clear.
- June 5. Clear.  
 8. Clear, between clouds.  
 10. Clear and fine.  
 12. Between many clouds.  
 16. Very clear between cumuli.  
 18. A little undulating, with S. wind.  
 20. Clear, with hazy clouds; steady images.  
 23. Clear, images sometimes a little blurred.  
 25. Much undulating, strong W. wind.  
 28. Hazy clouds.  
 30. Clear; limbs a little undulating.
- July 3. A little haze; neat and well defined images.  
 5. Steady; somewhat hazy.  
 9. Hazy, though pretty distinct images.  
 12. Clear.  
 15. Clear.  
 17. Clear between clouds.  
 19. Fine and clear.
- Aug. 5. Many clouds.  
 10. Many clouds.  
 16. Very clear and sharply defined images.  
 17. Clear and fine, though windy.  
 20. Clear.  
 22. Clear with many clouds; well defined images.  
 24. Clear.  
 27. Clear between clouds.  
 28. Between many clouds.  
 30. Clear with some clouds.
- Sept. 1. Clear.  
 2. Clear with many clouds; pretty steady images.  
 4. Clear and steady; fine.  
 22. Clear between clouds; limbs undulating.  
 24. Clear and fine.  
 27. Clear.  
 29. Very hazy; wind S.  
 30. Somewhat hazy, though steady and sharp images.
- Oct. 1. Clear; spots swimming.  
 3. Much blurring.  
 5. Clear; little blurring  
 6. Clear and fine.  
 7. Clear.  
 13. Clear, undulating.  
 14. Clear, with clouds; limbs somewhat undulating.  
 15. Clear and fine.  
 16. Clear and fine.  
 18. Clear, some blurring.  
 19. Clear, strong S. W. wind sometimes putting telescope into oscillations.  
 20. Clear through thin haze; very distinct and steady images.  
 21. Clear; S. W. wind.  
 22. Clear; strong gale S. E. shaking the telescope.  
 23. Clear.  
 27. Sometimes clear, mostly thick, between many clouds.  
 28. Clear, hazy toward the end.
- Nov. 1. Clear and fine; S. W. wind.  
 25. Clear sky; blurring images.  
 26. Very hazy.
- 1867 Jan. 2. Hazy; images very sharply defined.
- Mar. 8. Clear.  
 14. Clear between clouds; strong W. wind.  
 19. Fine, clear.  
 20. Clear; blurring images.  
 22. Hazy; images well defined.  
 24. Clear and pretty well defined images.  
 26. Clear.  
 30. Hazy.
- Apr. 3. Clear; fine.



- 1867 Apr. 9. Clear.  
19. Clear; blurring images.
- May 23. Clear between heavy clouds.  
24. Very clear between clouds.  
25. Well defined images; strong S. wind.  
27. Clear between many clouds.  
29. Clear and steady, with many clouds.  
31. Clear; telescope unsteady from strong W. wind.
- June 3. Clear between many clouds.  
4. Clear between many clouds.
- July 1. Clear.  
3. Smoky.  
4. Clear.  
6. Clear with clouds.  
13. Clear; limbs undulating.  
15. Clear and fine.  
16. Clear with clouds.
- Aug. 18. Clear and fine; some clouds.  
19. Clear with many clouds.
- Sept. 7. Clear and fine.  
8. Clear; limbs undulating.  
9. Clear; fine.  
11. Beautifully clear; images at times blurring.  
12. Fine and clear.  
13. Through thin haze between clouds; good and steady images.  
14. Fine and clear; images sometimes blurring.  
15. Bright and fine.  
17. Clear between many clouds.  
18. Clear and fine; then haze.  
19. Clear.  
20. Very fine and clear.  
21. Haze and thin clouds.
- Oct. 2. Through thin clouds, fine; then overcast.  
3. Thin and fine; through a large gap, then clouds.  
4. Clear and fine.  
7. Entirely clear; images a little blurring.  
8. Clear and fine.  
13. Clear through gaps between clouds.  
14. Undulating, between clouds; strong W. wind.  
16. Clear, though much blurring.  
17. Clear; the S. wind shaking the telescope.  
18. Clear, much wind, images trembling.
- Nov. 5. Clear with many clouds and strong wind.  
6. Badly swimming and undulating.  
7. Very hazy; blurring images.  
8. Extremely blurring; E. wind; the sky was quite clear.  
11. Hazy.  
12. Very hazy.  
13. Clear; much blurring and strong W. wind.
- Dec. 1. Clear; blurring.  
3. Pretty clear.  
4. Beautiful day, but sky with thin clouds; spots and limbs swimming.  
7. Haze or thin clouds between thicker ones.  
10. Between many clouds; observations often interrupted.  
26. Quite clear, but limbs much undulating.  
28. Through gaps between many clouds; images good.  
31. Clear; spots little swimming; S. wind.
- 1868 Jan. 5. Entirely clear; images blurring.  
10. Quite clear; heavy W. wind.  
11. Clear; well defined images.  
30. Hazy and images rather dim.
- Feb. 1. Clear and beautiful.  
5. Clear; images blurring; strong S. wind shaking telescope.  
8. Clear cold S. wind.
- Feb. 10. Badly swimming images.  
11. Sky quite clear; badly swimming images.  
18. Blurring.  
22. Quite clear; not quite steady.  
23. Haze or thin clouds; images indistinct.
- Mar. 4. Between snow clouds; blustering winds from W.  
5. Clear and fine.  
8. Fine and steady images, through a thin veil of haze.  
11. Clear, little haze; sharply defined images.  
14. Some haze; steady images.  
15. Beautifully clear; images steady and well defined.  
16. Sky very thick and hazy; smaller spots invisible; S. W. wind.  
19. Clear, little swimming.  
22. Clear, strong wind.  
23. Clear and fine.  
24. Clear, spots a little dull.  
25. Clear but badly blurring.  
26. Clear and fine.  
27. Very clear; sometimes blurring and undulating limbs.  
28. Clear, sometimes a little blurring.  
29. Clear.  
30. Steady, a little hazy.  
31. Clear and fine.
- Apr. 1. Clear and fine.  
3. Clear; limbs a little undulating.  
6. Clear and sharp, though strong S. wind.  
8. Very thick sky; spots scarcely seen at the end of the observation.  
9. Clear and sharp; strong W. wind.  
11. Clear: spots sometimes swimming.  
12. Very hazy with some few clear moments between.  
14. Clear; limbs very much undulating; strong S. wind.  
15. Clear; spots sometimes blurring; strong S. wind; warm and moist.  
17. Clear and fine, though limbs sometimes a little undulating; W. wind.  
19. Haze very thick with some clear moments, then overcast; strong S. wind.  
22. Clear and fine; west wind pretty strong.  
24. Perfectly clear; limbs a little blurring.  
26. Clear and fine, but strong W. wind sometimes shaking the telescope.  
28. Clear.  
30. Between many clouds; showery; strong W. wind shaking telescope.
- May 1. Hazy.  
3. Clear, though images often blurring.  
4. Between many flying clouds.  
9. Clear and fine, with clouds.  
12. Clear between clouds.  
14. Between many clouds.  
17. A little hazy, though images sharp.  
20. Fine images; hazy clouds.  
26. Clear.  
28. Clear and fine, with clouds.  
29. Clear.  
30. Clear; some hazy clouds.
- June 2. Clear.  
3. Clear.  
4. Through hazy clouds.  
6. Through hazy sky, with many clouds; strong S. wind.  
8. Clear.  
10. Clear; some haze.  
12. Clear.  
13. Hazy, though spots well defined and steady.  
15. Hazy.

- 1868 June 17. Clear and fine.  
 19. Clear with clouds; steady images.  
 20. Clear.  
 23. A little smoky, after a heavy rain on the day preceding.  
 25. Clear, but blurring images; E. wind.  
 26. Sky hazy; though steady and well defined images.  
 27. Clear.  
 28. Smoky and images sometimes blurring, still pretty distinct.  
 30. Clear.
- July 1. Blurring.  
 2. Much blurring.  
 3. Clear.  
 4. Clear.  
 5. Clear and fine.  
 12. Clear.  
 17. Clear.  
 18. Clear; sometimes blurring images.  
 19. At first many clouds, then pretty steady.  
 20. Clear.  
 26. Smoky, though well defined images.  
 28. Very thick, smoky.  
 31. Many clouds.
- Aug. 2. Clear.  
 9. Clear and good images.  
 11. Many clouds.  
 12. Fine and clear, between clouds.  
 13. Fine and clear, strong W. wind.  
 14. Clear, little undulating.  
 16. Clear, between clouds, very fine.  
 17. Clear; spots sometimes badly blurring; wind E.  
 18. Fine and clear; strong S. wind.  
 19. Many clouds.  
 21. Fine, clear, with clouds.  
 22. Blurring.  
 23. Very fine, at times blurring.  
 25. Fine, clear; limbs sometimes a little undulating.  
 26. Clear.  
 28. Limbs undulating, wind S.  
 31. Clear, with some passing clouds.
- Sept. 2. Very clear; limbs sometimes in undulation.  
 5. Strong W. wind and many clouds which sometimes produce a strong blurring.  
 6. Haze rather thick, though clear when sketch was made.  
 8. Fine, clear; spots frequently blurring.  
 10. Haze very thick (so that the declination of fainter spots could not be read).  
 12. Clear, between many flying clouds over the sun; sometimes blurring; wind E.  
 14. Very hazy.  
 15. Very distinct, though limbs tremulous with S. E. wind.  
 16. Very clear, between many clouds; gale blowing from the W.  
 17. Clear with clouds.  
 21. Blurring.  
 26. Clear with thin hazy clouds sometimes; limbs blurring  
 28. Very clear, with interruptions of clouds; wind strong W.  
 29. Clear with many clouds; strong W. wind.
- Oct. 1. Well defined and steady, though hazy clouds.  
 3. Quite clear, somewhat blurring.  
 5. Fine, clear, with some clouds.  
 9. Clear, badly undulating limbs.  
 11. Clear and well defined; strong S. W. wind.  
 16. Clear and pretty steady.  
 17. Clear (during night first slight fall of snow of the season).  
 27. Extremely blurring and undulating; gale of S. wind.  
 29. Clear though blurring.
- Nov. 3. Clear, somewhat blurring.
- Dec. 19. Blurring; sky quite clear. After a long period of constantly dark weather, it had cleared up toward morning finally.  
 24. Dancing with light clouds.
- 1869 Jan. 7. Clear; little blurring.  
 10. Clear; well defined limbs and spots.  
 14. Clear, a little hazy; S. wind.  
 16. Clear, steady.  
 27. Clear, with a little haze.  
 29. Fine and clear, little blurring.
- Feb. 1. Clear.  
 2. Very thick haze.  
 7. Very much blurring.  
 13. Blurring; sometimes steady.  
 25. Clear and sharply defined; strong W. wind.  
 28. Clear.
- Mar. 1. Clear, some blurring.  
 3. Fine.  
 9. Clear.  
 12. Clear between clouds and snow storm.  
 16. Very clear, through many clouds.  
 17. Clear, little blurring, some haze; halo around the sun.  
 18. Fine, clear, with clouds.  
 21. Clear and fine, though strong W. wind.  
 22. Clear, sometimes haze; strong E. S. E. wind, shaking the telescope.  
 25. Rather clear.  
 28. Clear and fine.
- Apr. 1. Very hazy.  
 10. Clear, with some clouds and W. wind.  
 13. Many clouds, clear between.  
 15. Clear and fine.  
 18. Clear, with some light clouds; spots very fine and distinct.  
 23. Fine, clear; wind E.  
 25. Clear, but wind very strong.  
 29. Hazy, clear between.
- May 6. Fine, clear, sometimes blurring.  
 8. Clear; strong wind.  
 10. Clear and fine.  
 12. Clear, sometimes blurring; then with clouds.  
 14. Clear, blurring in the latter sets.  
 20. Clear; strong wind.  
 22. Many clouds.  
 23. Hazy, though very well defined.  
 24. Hazy, beautifully distinct.  
 27. Somewhat hazy.  
 31. Very clear, with many clouds.
- June 1. Clear, with hazy clouds.  
 9. Clear, sometimes a little blurring.  
 12. Many clouds; very clear between.  
 14. Very clear, between many clouds; blurring.  
 16. Fine, clear, little tremulous, after heavy rain showers.
- July 17. Clear and distinct.  
 18. Clear, little hazy, well defined.  
 20. Very many clouds; S. wind.  
 22. Very clear and neat, with clouds and W. wind.  
 25. Clear and neat; S. wind; a little hazy.
- Aug. 18. Hazy with clouds; clear sometimes between the haze.  
 19. Some haze.  
 22. Clear.  
 23. Clear.  
 24. Very clear, between many clouds.  
 26. Clear and pretty steady, sometimes blurring.  
 28. Clear.
- Sept. 11. Fine and clear.



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| <p>1869 Sept. 13. Clear and fine.<br/> 17. Very many clouds.<br/> 19. Clear and very fine.<br/> 20. Fine and clear.<br/> 23. Clear after two days of rain; some thin clouds flying.<br/> 24. Clear and distinct.<br/> 28. Many clouds, otherwise pretty steady and clear.<br/> 30. Clear, sometimes blurring.</p> <p>Oct. 2. Clear; sometimes blurring, with strong S. wind.<br/> 6. Beautifully clear; limbs a little undulating.<br/> 8. Fine and clear.<br/> 11. Many clouds, though clear between.<br/> 16. Between very many clouds; very clear.<br/> 21. Very clear, though undulating.<br/> 25. Clear, though strong W. wind.</p> <p>Nov. 2. Clear, with some blurring of limbs.<br/> 3. Little hazy.<br/> 4. Very clear and fine.<br/> 13. Rather hazy, and often badly blurring and indistinct.<br/> 14. Haze very thick; wind E.<br/> 19. Very hazy.<br/> 22. Clear, but very much blurring, spots sometimes dancing.<br/> 24. Blurring.</p> <p>Dec. 3. Clear between thick snow clouds.<br/> 9. Fine and clear; wind S.<br/> 27. Fine, though hazy.</p> | <p>1870 Jan. 19. Sky thick, only sometimes clear between; calm.<br/> 22. Hazy, blurring; spots dim; S. wind.<br/> 26. Fine.<br/> 28. Clear, but very much blurring; wind S. W.<br/> 31. Hazy.</p> <p>Feb. 7. Very clear, with clouds; sometimes blurring.<br/> 10. Very fine and clear, then suddenly clouding up thickly.<br/> 23. Clear and fine images; cold weather.<br/> 26. Clear and fine.</p> <p>Mar. 6. Hazy and thin clouds, sometimes indistinct; wind S. W.<br/> 9. Beautifully clear and distinct.<br/> 14. Well defined and through haze.<br/> 18. Fine, clear, but blurring or rather undulating.<br/> 24. Fine, clear; strong W. wind.</p> <p>Apr. 3. Very clear; wind; limbs a little undulating.<br/> 9. Fine, clear.<br/> 13. Beautiful, clear, and finely distinct.<br/> 23. Clear.<br/> 26. Fine and clear.<br/> 30. Fine, though somewhat hazy.</p> <p>May 5. Clear and fine.<br/> 13. Very fine.<br/> 19. Clear with clouds.<br/> 27. Clear and fine; strong E. wind.<br/> 30. Clear and distinct.</p> |
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# SUMMARY BY DATES OF NUMBER OF SPOTS OBSERVED

This summary was extracted from the fourteen observing books of Dr. Peters, each of which contained such a list of the numbers of spots observed. A résumé up to August 17, 1863, was published in his article in *Astronomische Nachrichten*, 64, 213-218, 1865, with the following words of description (translated):

"The following table contains for each observing day the number of spots of which the co-ordinates were determined as stated. To these are also added the days on which variable weather permitted the spots to be sketched

only and not to be measured. For these, the numbers signify merely countings from the sketches, and they are therefore enclosed in parentheses. The observations were interrupted in August, 1863, by a long trip to Europe, and were not begun again until the beginning of November of last year. The résumé may, therefore, embrace for now only the first series. Inasmuch as some time will be required for the complete publication I shall be ready, upon request, to communicate the details for separate days by letter."

Date	No. of Spots	Date	No. of Spots	Date	No. of Spots	Date	No. of Spots	Date	No. of Spots
1860		July 31	22	Oct. 31	22	Feb. 28	28	May 8	(7)
May 23	15	Aug. 1	26	Nov. 2	(20)	March 4	29	9	6
24	16	3	24	4	24	7	20	12	4
25	17	5	27	5	27	11	15	14	9
28	(17)	6	24	7	25	14	(13)	15	6
29	16	11	30	8	27	15	13	19	11
June 3	17	15	19	16	19	16	21	21	11
4	13	16	13	22	13	18	9	23	14
5	17	17	14	24	15	19	16	25	13
6	17	18	16	25	16	20	19	30	18
11	11	19	16	27	(16)	22	18	31	22
12	15	20	19	28	18	23	23	June 1	18
13	18	Sept. 15	17	Dec. 8	(24)	25	16	5	22
14	12	17	20	13	(14)	28	36	7	23
15	14	18	17	14	13	29	(40)	9	9
16	15	20	20	15	10	31	49	10	8
17	16	22	17	23	22	April 4	38	12	10
18	13	23	17			5	34	13	10
19	16	24	19	1861		6	25	17	29
20	21	25	27	Jan. 2	16	7	19	18	42
27	40	26	27	4	15	8	19	20	34
28	41	28	19	5	14	9	19	22	28
29	(22)	30	17	12	8	10	15	24	17
30	34	Oct. 6	22	22	17	11	10	25	18
July 4	27	7	18	23	12	18	(18)	27	14
6	29	10	13	25	18	19	16	29	12
7	21	12	18	27	16	21	19	July 1	13
8	15	15	20	Feb. 1	11	22	19	3	20
9	15	16	17	3	(2)	23	22	5	19
11	16	18	18	6	11	25	24	7	13
15	12	19	17	12	26	26	30	9	15
18	20	22	(10)	14	14	27	31	11	18
20	20	23	(9)	16	33	29	23	17	15
22	27	24	11	22	29	May 2	21	19	10
24	27	25	14	25	23	4	23	21	11
28	27	27	8	26	23	5	22	23	21
30	31	30	12	27	23	7	13	25	17

Date	No. of Spots	Date	No. of Spots	Date	No. of Spots	Date	No. of Spots	Date	No. of Spots
1861		Dec. 14	28	April 24	14	Aug. 20	29	Feb. 8	16
July 27	18	15	27	25	14	22	24	11	22
Aug. 1	30	16	28	26	19	24	12	14	17
3	20	17	32	27	23	26	18	15	15
4	18	18	(23)	May 3	(13)	29	13	16	15
11	19	21	(20)	4	24	31	13	17	17
14	17	22	14	5	21	Sept. 3	18	18	13
16	13	25	18	6	19	5	19	21	24
18	18	28	20	8	15	7	17	23	21
19	17	30	11	10	12	9	13	25	14
Sept. 7	13	31	17	11	13	11	12	28	15
9	8			12	15	13	9	March 2	18
12	9	1862		14	23	15	14	4	22
15	14	Jan. 2	21	15	19	17	14	5	19
22	23	3	16	17	14	19	33	9	24
24	22	4	16	20	14	21	29	10	22
26	20	7	30	22	17	23	31	11	25
29	27	8	(17)	24	21	25	28	12	16
Oct. 1	20	11	19	26	30	27	29	13	13
8	9	13	23	28	22	Oct. 3	12	14	18
10	5	14	23	30	24	5	10	15	10
12	20	16	12	June 5	26	7	14	16	11
14	34	24	16	8	35	12	6	18	23
19	(16)	27	19	20	27	15	7	19	21
20	28	31	12	22	37	18	12	20	14
21	26	Feb. 5	21	26	25	20	10	24	(31)
25	23	7	19	29	19	23	14	26	29
26	27	8	18	July 1	19	28	24	30	26
27	29	11	27	3	16	30	(19)	April 3	16
28	31	16	26	6	18	31	25	4	13
29	17	March 8	10	7	18	Nov. 2	8	9	6
Nov. 1	17	9	9	8	17	4	14	10	(6)
10	17	11	13	10	19	11	10	11	8
12	19	13	19	11	22	14	15	13	14
14	14	18	21	13	25	15	12	14	15
15	19	19	12	15	20	25	10	19	13
18	25	20	10	18	24	28	(7)	21	12
19	23	25	2	19	27	30	2	22	15
20	19	26	8	24	(10)	Dec. 5	1	23	11
22	10	27	8	25	23	8	4	24	11
24	16	28	6	27	25	11	4	26	3
25	17	29	2	29	30	12	10	27	(1)
26	16	April 3	(25)	31	27	17	21	28	8
27	12	4	26	Aug. 2	27	20	11	29	8
Dec. 2	25	6	17	4	32			30	14
3	27	7	15	6	26	1863		May 1	14
4	32	9	13	8	21	Jan. 18	10	2	22
5	24	10	15	10	19	19	12	3	22
7	25	11	10	12	22	25	17	5	19
10	18	12	12	14	9	30	18	8	18
11	29	13	14	15	11	31	19	9	18
12	23	20	15	17	14	Feb. 2	10	10	12
13	34	22	17	18	19	4	7	11	14

Date	No. of Spots	Date	No. of Spots	Date	No. of Spots	Date	No. of Spots	Date	No. of Spots
1863		Dec. 9	1	April 19	8	Aug. 14	6	Dec. 31	13
May 13	21	13	8	24	1	16	2		
17	10	18	8	26	4	18	4	1866	
19	11	20	7	27	9	19	5	Jan. 3	7
21	10	22	6	30	9	20	4	5	5
23	10	25	7	May 2	10	24	11	7	5
26	21	27	9	3	9	26	9	9	5
28	20	30	(4)	5	18	27	12	14	4
30	21	31	8	7	16	Sept. 6	4	17	7
June 4	17			12	8	7	2	18	7
9	13	1865		13	11	10	1	22	5
11	5	Jan. 2	6	15	9	12	3	23	3
13	9	5	(5)	17	4	14	4	24	7
15	14	8	4	21	5	15	5	27	4
18	9	11	10	23	1	17	6	31	8
20	6	12	12	25	3	19	5	Feb. 5	6
22	5	15	(14)	26	5	22	6	7	2
24	11	16	14	30	11	24	8	15	9
26	16	18	15	31	16	25	10	16	12
28	19	20	19	June 1	13	27	9	17	12
30	10	24	21	2	12	29	5	21	(8)
July 2	7	25	17	4	14	Oct. 1	2	22	10
5	13	26	(16)	7	10	3	4	23	(8)
9	14	27	13	8	11	6	1	26	3
14	12	Feb. 2	1	11	13	9	8	28	5
18	7	12	14	12	11	11	9	March 1	4
20	5	13	14	14	9	13	11	2	4
22	3	15	13	17	5	16	7	3	3
24	2	17	10	21	0	17	7	6	3
26	6	18	5	23	4	19	2	8	1
28	6	21	10	25	1	20	0	10	4
Aug. 2	14	24	2	27	5	21	0	17	4
7	17	25	3	28	2	22	0	19	4
9	14	27	12	29	4	23	0	22	5
11	18	March 5	14	30	7	24	0	27	12
13	18	6	11	July 2	2	Nov. 1	0	30	4
15	18	10	11	3	0	11	4	April 2	2
17	19	11	7	5	1	12	3	3	3
		12	15	8	7	13	4	4	4
		14	12	9	5	15	7	5	4
1864		16	17	10	5	16	8	8	5
Nov. 2	14	17	17	14	4	24	8	9	5
6	9	19	7	17	5	26	11	10	6
7	7	21	7	18	5	27	14	11	5
10	13	23	4	21	6	30	9	13	4
14	8	27	9	23	6	Dec. 3	3	14	4
18	6	28	10	27	10	5	2	15	6
19	7	April 1	6	29	13	9	0	17	5
22	12	2	4	30	13	11	2	20	3
23	(12)	7	(0)	Aug. 4	11	16	3	22	3
25	15	9	3	8	9	22	2	27	9
29	(16)	13	3	9	8	23	2	29	0
Dec. 1	17	17	12	12	3	25	0	30	0
8	2								



Date	No. of Spots	Date	No. of Spots	Date	No. of Spots	Date	No. of Spots	Date	No. of Spots
1866		Sept. 30	6	March 8	0	Sept. 11	9	Jan. 19	0
May 4	2	Oct. 1	5	10	0	12	5	22	0
6	0	3	3	14	2	13	9	28	0
15	7	5	3	19	4	14	13	30	3
17	2	6	2	20	3	15	15	Feb. 1	6
19	6	7	1	22	5	16	(9)	5	4
20	4	8	0	24	7	17	7	6	(2)
24	1	11	0	26	3	18	10	8	2
30	1	13	1	30	3	19	6	10	3
June 1	3	14	1	April 3	5	20	2	11	1
5	5	15	1	9	4	21	1	14	0
8	4	16	5	12	0	23	0	16	0
10	2	18	2	19	1	25	0	18	7
12	1	19	5	25	0	28	0	22	7
16	5	20	8	28	0	Oct. 2	3	23	3
18	5	21	7	May 2	0	3	5	March 4	4
20	4	22	5	12	0	4	4	5	5
23	6	23	2	16	0	7	9	8	4
25	3	27	1	23	1	8	7	9	(4)
28	6	28	8	24	5	13	3	11	5
30	9	Nov. 1	4	25	5	14	3	14	7
July 3	6	4	0	27	4	16	4	15	14
5	4	5	0	29	3	17	4	16	17
9	1	6	0	31	4	18	2	19	8
12	1	7	0	June 3	1	19	0	22	2
15	1	8	0	4	1	21	0	23	5
17	3	10	0	9	0	23	0	24	7
19	1	13	0	13	0	25	0	25	10
24	0	14	0	19	0	27	0	26	7
27	0	19	(2)	24	0	Nov. 1	0	27	9
31	0	25	7	29	0	5	1	28	9
Aug. 5	2	26	6	July 1	5	6	1	29	6
10	4	Dec. 1	0	3	7	7	1	30	10
16	6	14	0	4	2	8	1	31	13
17	6	20	0	6	1	11	1	April 1	17
20	5	21	0	7	0	12	1	3	7
22	4			13	1	13	1	6	10
24	2	1867		15	1	30	(2)	8	5
27	1	Jan. 2	3	16	2	Dec. 1	10	9	4
28	1	7	0	28	0	3	9	11	10
30	1	8	0	31	0	4	4	12	8
Sept. 1	1	10	0	Aug. 5	0	7	2	14	5
2	1	12	0	9	0	10	1	15	13
4	1	14	0	14	0	13	0	16	(11)
9	0	18	0	18	5	26	23	17	12
10	0	20	0	19	5	28	17	19	11
12	0	30	0	25	0	31	6	21	7
14	0	Feb. 6	0	30	0			22	9
15	0	7	0	Sept. 3	0	1868		24	7
22	1	19	0	4	0	Jan. 5	5	25	2
24	2	24	0	7	2	10	9	26	4
27	1	March 1	0	8	3	11	6	28	4
29	5	6	0	9	4	16	0	30	3

Date	No. of Spots	Date	No. of Spots	Date	No. of Spots	Date	No. of Spots	Date	No. of Spots
1868		July 26	13	Oct. 29	30	May 20	8	Nov. 3	12
May 1	3	27	10	Nov. 3	20	22	5	4	15
3	2	31	7	Dec. 19	2	23	7	6	(13)
4	4	Aug. 2	8	24	15	24	11	13	20
9	11	9	9			27	21	14	11+(3)
12	15	11	2+(4)	1869		31	27	19	12
14	4	12	4	Jan. 7	15	June 1	37	22	12
17	5	13	8	10	8	4	(29)	24	13
20	9	14	12	14	19	6	(25)	Dec. 3	21
25	0	16	11	16	12	9	25	9	24
26	2	17	10	27	13	12	19	15	(20?)
28	3	18	12	29	18	14	11	27	9
29	6	19	11	Feb. 1	24	16	12		
30	8	21	7	2	15	July 17	24	1870	
June 1	(17)	22	9	7	10	18	25	Jan. 19	25
2	17	23	9	13	13	20	26	22	20
3	11	25	10	25	9	22	14	26	17
4	13	26	12	28	11	25	5	28	20
6	4	28	5	March 1	10	Aug. 18	25	31	16
8	6	31	2	3	9	19	30	Feb. 4	(18)
10	1	Sept. 2	11	9	12	22	15	7	25
12	3	5	13	12	20	23	17	10	37
13	1	6	13	16	20	24	16	11	(34)
15	2	8	9	17	18	26	12	23	16
17	3	10	17	18	20	28	5	26	26
19	7	12	18	21	18	Sept. 7	(32)	March 6	39
20	8	13	(13)	22	16	9	(22)	9	36
23	10	14	11	25	7	11	21	14	27
25	7	15	13	28	11	13	21	18	32
26	4	16	11	April 1	6	17	15	24	36
27	9	17	7	2	(3)	19	12	April 3	37
28	11	21	8	6	(4)	20	9	9	37
30	17	26	7	10	7	23	9	13	21
July 1	9	28	10	13	10	24	11	23	25
2	8	29	13	15	20	28	19	26	28
3	6	Oct. 1	13	18	18	30	19	30	22
4	6	3	8	23	5	Oct. 2	16	May 5	28
5	5	5	7	25	9	6	20	13	35
9	0	9	4	29	20	8	13	19	35
12	2	11	6	May 6	28	11	7	27	27
17	7	16	7	8	34	16	13	30	20
18	8	17	6	10	36	21	10	1120+(52) days	
19	10	24	10	12	37	25	7	13230+(750) spots	
20	11	27	26	14	34	Nov. 2	13		

Dr. Peters' notes include, beside the statement of the weather conditions, references to Wilson's theory of the depression of sun-spots. A total of 172 spots are mentioned in this connection, of which 141 favor Wilson's theory, and 31 are opposed to it. To make these observations available for any possible discussion on this point, the dates are here given, with the letter identifying the spot.

## SPOTS FAVORING WILSON'S THEORY

1860 June 15, <i>h</i> and <i>h'</i> June 16, <i>i</i> 20, <i>h</i> and <i>h</i> July 4, <i>a</i> and <i>b</i> 6, <i>a</i> 8, <i>b</i> 15, <i>f</i> 20, <i>h</i> 22, <i>m</i> 24, <i>o</i> July 30, <i>a</i> and <i>e</i> Aug. 16, <i>g</i> 20, <i>a</i> Sept. 15, <i>f</i> 30, <i>b</i> and <i>h</i> Oct. 15, <i>e</i> Nov. 25, <i>b</i> 1861 Feb. 25, <i>i</i> April 25, <i>m</i> and <i>n</i> 27, <i>q</i> May 5, <i>g</i> 7, <i>d</i> June 7, <i>a</i> 13, <i>g</i> 22, <i>d</i> 29, <i>d</i> , <i>d'</i> July 5, <i>b</i> 7, <i>a</i> 11, <i>h</i> 27, <i>e</i> Aug. 1, <i>c</i> Sept. 29, <i>c</i>	Oct. 1, <i>a</i> Nov. 1, <i>b</i> 20, <i>d</i> Dec. 5, <i>h</i> 13, <i>h</i> 15, <i>a</i> 1862 Jan. 24, <i>a</i> Feb. 7, <i>a</i> 8, <i>a</i> 11, <i>f</i> Mar. 19, <i>b</i> April 25, <i>a</i> May 8, <i>e</i> 11, <i>f</i> 15, <i>h</i> 28, <i>f</i> June 5, <i>b</i> 22, <i>k</i> <sup>3</sup> 26, <i>a</i> July 11, <i>e</i> 19, <i>a</i> 27, <i>a</i> Aug. 8, <i>a</i> 22, <i>a</i> and <i>b</i> 24, <i>f</i> Sept. 17, <i>a</i> 25, <i>b</i> Dec. 12, <i>e</i> 1863 Jan. 18, <i>d</i> 31, <i>a</i> Feb. 18, <i>e</i> and <i>g</i> April 3, <i>a</i>	April 13, <i>d</i> and <i>d</i> <sup>5</sup> 23, <i>g</i> 24, <i>a</i> May 5, <i>a'</i> 9, <i>g</i> July 5, <i>f'</i> Aug. 7, <i>a</i> 1864 Dec. 9, <i>a</i> 1865 Feb. 12, <i>c</i> <sup>4</sup> 24, <i>a</i> May 15, <i>a</i> 26, <i>a</i> and <i>b</i> 1866 Jan. 3, <i>c</i> Mar. 3, <i>b</i> May 20, <i>b</i> June 28, <i>c</i> Sept. 30, <i>a</i> Oct. 1, <i>a</i> 28, <i>a</i> 1867 July 4, <i>a</i> Oct. 18, <i>a</i> Dec. 1, <i>d</i> 1868 Mar. 5, <i>a</i> April 8, <i>a</i> 22, <i>b</i> June 8, <i>c</i> July 2, <i>a</i> 3, <i>a</i> 28, <i>a</i> Aug. 26, <i>a</i> Sept 15, <i>a</i> 29, <i>f</i>	Oct. 1, <i>d</i> 29, <i>a</i> 1869 Mar. 1, <i>a</i> 17, <i>e</i> April 18, <i>e</i> 25, <i>d</i> May 10, <i>i</i> 20, <i>d</i> 24, <i>d</i> 31, <i>b</i> June 1, <i>a</i> 12, <i>b</i> July 18, <i>h</i> Aug. 24, <i>a</i> Sept. 13, <i>b</i> 20, <i>c</i> Oct. 6, <i>c</i> 16, <i>a</i> 21, <i>f</i> Nov. 13, <i>h</i> Dec. 9, <i>b</i> and <i>c</i> 1870 Jan. 28, <i>b</i> Mar. 14, <i>a</i> April 3, <i>d</i> 9, <i>a</i> 13, <i>b</i> 23, <i>a</i> 30, <i>a</i> , <i>b</i> , <i>c</i> , <i>e</i> May 13, <i>m</i> and <i>o</i> Total 141
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## SPOTS OPPOSING WILSON'S THEORY

1860 Aug. 6, <i>c</i> and <i>n</i> Oct. 31, <i>f</i> <sup>3</sup> 1861 Jan. 5, <i>f</i> April 5, <i>b</i> 27, <i>a</i> June 29, <i>f</i> Nov. 1, <i>f</i> Dec. 2, <i>g</i>	Dec. 12, <i>g</i> 1862 Jan. 14, <i>g</i> April 12, <i>a</i> 13, <i>a</i> 25, <i>f</i> June 8, <i>b</i> 20, <i>g</i> July 10, <i>d</i>	July 31, <i>f</i> Aug. 18, <i>e</i> Sept. 15, <i>d</i> and <i>e</i> 25, <i>g</i> Oct. 28, <i>i</i> 1863 Feb. 21, <i>b</i> Mar. 13, <i>a</i> May 8, <i>a</i>	1865 Mar. 11, <i>a</i> 1868 May 3, <i>b</i> 1869 June 1, <i>g</i> Sept. 24, <i>d</i> 1870 May 30, <i>b</i> Total 31
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Aside from the references to Wilson's theory, the notes contain one other item which perhaps ought to be recorded, viz., July 5, 1868: Spot *a*. "A notch on the sun's limb formed by the elevation of photospheric matter. The sun's limb very sharply defined."



LIST OF THE PRINCIPAL PAPERS BY DR. C. H. F. PETERS DEALING WITH SOLAR OBSERVATIONS

"Contributions to the Atmospherology of the Sun," *Proceedings of the American Association for the Advancement of Science*, Vol. IX, pp. 85-97, 1855.

A summary of this paper is given in a letter to Humboldt, published in *Poggendorffs Annalen*, 96.

"A Method for Deriving the Geocentric Right Ascension and Declination of a Solar Spot from Its Heliographic Co-ordinates," Brünnow's *Astronomical Notices*, No. 6, 1859.

"Uebersicht der auf der Sternwarte des Hamilton College angestellten Sonnenbeobachtungen," *Astronomische Nachrichten*, 64, 209-20, 1865.

"Zur Refraction auf der Sonne," *ibid.*, 71, 241-52, 1868.

"Some Critical Remarks on So-called Intra-mercurial Planet Observations," *ibid.*, 94, 321-36, 337-40, 1879.























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